[From Schenckius: Observationum Medicarum, Francofurti, 1609.]

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ROMAN ARCHITECTURAL HYGIENE*

By CHAUNCEY D. LEAKE

SAN FRANCISCO, CALIF.

The special talent of the Romans was for military science and the making and administering of laws. Their hygienic achievements, such as cremation, the sensible, well-ventilated houses, the great aqueducts, sewers, drains, and public baths, were of far greater consequence than their native literary contributions to medicine.
—Fielding H. Garrison

A General Consideration of Roman Professional Medicine

Quisque volens faciat medicinam.—
Scribonius Largus (*ca.* 47 A.D.)

SIGNIFICANT of Roman Civilization is the fact that in its fullest flowering of culture and grandeur in a time period equal to that from the Renaissance to the present, there were to be found not many more distinguished physicians than can be counted on the fingers of two hands. In chronological order, these men may be named: Asclepiades, born about 124 B.C., who began the futile theorizing of later days with the inauguration of methodism; Aulus Cornelius Celsus, the mysterious amateur encyclopedist, who copied his remarkable medical treatise about 30 A.D.; Dioscorides, the surgeon in Nero's armies, who gave us the best account of the materia medica of the ancients; Aretaeus, living during the reign of Domitian, who was a clever clinician, writing wisely and clearly on the characteristics and treatments of disease; the three surgeons, Heliodorus, Archigenes and Antyllus, who were skilled in amputation and the use of ligatures; Rufus, who flourished under Trajan and who was an anatomist of no small ability, especially in connection with the eye and nervous system; Soranus, the obstetrician and gynecologist of the second century, "whose memory was reverenced till far into the Middle Ages," and Galen (131–201 A.D.), who was the greatest of Roman physicians, and the founder of experimental medicine. The later fourth to seventh century group, Oribasius, Aetius, Alexander of Tralles and Paul of Aegina, were Byzantines, and compilers of the medical knowledge previously accumulated.

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*This sketch was presented many years ago before Dr. William Snow Miller's Wisconsin Medical History Seminar. It has recently been rewritten for presentation before the first meeting of the California Medical History Seminar.

These, of the thousands of men who must have practiced medicine during the Roman ascendency, were the chief ones to attract attention by their skill or writings. They alone indicated a reverence for the Hippocratic tradition, and a desire to develop the practical medical experience so recently weaned from the theurgic care of the cult of Aesculapius.

The rank and file of Roman physicians were miserable. Charlatanry and quackery ruled. The capital attracted the clever and unscrupulous from every province, and it was easy to take advantage of the gluttony, luxury, and superstition of the people, and to wax fat as a medical menial. In the mad metropolis, where public success alone was sought, careful practice and critical investigation vanished, and medicine really became for the time being the trade it always gives threat to become. Fanatical wrangling and snobbish specialization gave an appearance of skill and attainment, but freedom of thought, which in Greece contributed to the rise of medicine and science, became in Rome a cause for its intellectual and ethical degeneration.

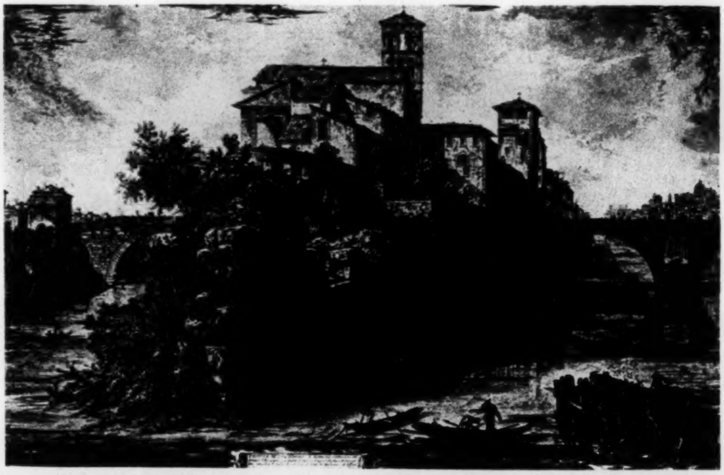

FIG. 1. "SHIP OF AESCULAPIUS," ROME, 18TH CENTURY. (FROM AN ETCHING BY G. B. PIRANESI (1720–1778).)

As noted by Neuburger, many reasons hindered the development of medicine among the Romans. Devoting their energy to the growth of state power, they showed little interest in natural phenomena. There was little need for careful and discriminating medical practice. Physical soundness, rigorous training in youth and fundamentally simple habits prevented many diseases. Epidemics never excited curiosity as to their possible origin, but were feared with superstitious awe. For the Roman, skill only in the forum or in the battle was laudable, and slaves took care of everything else. Medicine, practiced chiefly by the despised Greeks, was held in contempt, as observed by Garrison, because the physicians were considered menial in accepting fees for their services and because they were distrusted as possible poisoners.

With the decline of the professional status of medicine in Rome, a lively interest in medical affairs arose on the part of the laity, so that we find scarcely a classical writer of the Roman Empire who does not display somewhere a shrewd and surprising insight into such matters. Celsus is the striking example of this tendency which reached its greatest practical importance among the architects and engineers.

Rome was a huge and growing city, situated on hills between which were great swamps, and it was faced with the acute problem of draining these swamps, not to improve the health of the city, but to use the land. It had to secure an adequate and drinkable water supply. Its monumental excreta had somehow to be carried away. The bodies and clothes of its fastidious citizens had to be kept clean. These were practical and not necessarily medical problems, the health of the people being considered to lie in the hands of the gods anyway, but if in the solution of these problems the Roman architects and engineers developed a sanitary science unsurpassed until modern times, making Rome a comparatively healthy home for over two million individuals at one time, so much the more credit to them and so much the less to Roman medicine which had no share in the accomplishment.

Drainage and Sewage Disposal in Rome

Colles in regione pestilenti salubres.—Livy (Lib. v)

Among the Romans themselves none denied the inherent unhealthiness of the region about the city. Much of this was probably only repetition of traditional hearsay, for the evidence favors the view that Rome, at least during the Empire, was a comparatively healthy place. Both Pliny and Cicero speak of it as a pestilential district, and during their lives temples to the Goddess of Fever were still standing, silent memories of past epidemics and superstitious appeals to the gods in sanitary ignorance. It was early recognized that the hills were healthier than the swamps and marshes between, and this factor, together with the necessity of using the lowlands for building purposes, soon led to their drainage.

That the Romans may be thought to have had some inkling as to the etiological agents present in malaria can be shown by several writers. Varro says:[1]

> If you should have to build near a river, do not construct your house so as to face it, for it will be very cold in winter and unhealthy in summer. See if there be any swampy land near, for certain tiny animals, invisible to the eye, breed there, and being carried through the air, may reach the inside of the body, causing diseases hard to cure. Fundanius asked: What shall I do to escape fever if I inherit such an estate? I said: Sell it . . .

Columella[2] speaks of fevers being caused by *infestis aculeis animalia*, which may refer to mosquitoes, and Vitruvius is careful to point out the dangers of building near marshy land.

[1] Lib. 1, Cap. xii.

[2] Lib. 1.

The downfall of ancient Greece and Rome has been ascribed by various authors to the deteriorating influence of malaria. In Rome however, this is a questionable matter, since during the Empire, and indeed until the barbarian invaders had already cut the aqueducts and choked the drains, malaria was not common in the city, nor in the immediate vicinity. It was not until far into medieval times that the inhabitants of Rome again lifted helpless hands to heaven and built a chapel to Our Lady of the Fever.

In the famous treatise on malaria as a neglected factor in the history of Greece and Rome, Jones gives in a very judicious manner his reasons for believing that malaria was common in Rome all during ancient times. For the most part he relies upon quotations from Horace, Juvenal and Martial, and upon the extensive writings of Celsus on the intermittent fevers. He admits that the many epidemics referred to by Livy during the Republic were probably other than malaria, since the latter works insidiously over a long period of time, weakening the body and intellect by degrees, and because of its chronic nature not likely to arouse any great or sudden concern, as in an epidemic of some more virulent disease. Summing up, however, its total effect on Greece and Rome, he says: "Malaria made the Greek weak and inefficient; it turned the sterner Roman into a blood thirsty brute . . . *atra bilis* made its victims mad." But in spite of all the evidence that Jones marshalls to prove that Rome was a city of sickness and suffering because of endemic malaria (evidence, by the way, much less conclusive than in the case of Greece), it cannot be admitted that it was, during the Empire at least, without more direct testimony. During "ancient times," as Frontinus says, the city had a bad reputation because of disease, but there is no reason to believe that it had a similar reputation under the Caesars. Even the statement of Galen that malaria was of everyday occurrence in the city is not very striking, since the same thing may be said of any of our modern cities of equal size and in the same climate; that too, in spite of our present knowledge of its cause, and of our specific, quinine, against it. Jones himself quotes North's "Roman Fever:"

> Some recent writers on the subject would have us believe that many of the great pestilences of which we have record were malarial. There is, however, but slight justification for this view. For the most part, they followed upon wars and times of scarcity; the mortality, as a rule, was great, and the disease communicable from one individual to another; more than this, it is recorded in many cases that the cattle suffered as much as human beings, if not more. Altogether, in the absence of all proof to the contrary, it would seem more just to assume that these visitations were not malarial, but rather of the nature of malignant typhus, or plague, so-called. At any rate, there is no proof whatsoever that they *were* malarial, and not only so, but it is highly improbable that such was the case; for, as far as our experience goes, epidemic malaria of a grave type is chiefly confined to the tropics, and even there is not common.

This seems a fair summary of the facts known about the epidemics which visited Rome.

Referring to the healthiness of Rome during the Empire, Lanciani says:

> Sanitary reform was accomplished, firstly, by the draining of marshes and

ponds; secondly, by an elaborate system of sewers; thirdly, by the substitution of spring water for that of polluted wells; fourthly, by the paving and multiplication of roads; fifthly, by the cultivation of land; sixthly, by sanitary engineering, applied to human dwellings; seventhly, by substituting cremation for burial; eighthly, by the drainage of the Campagna; and lastly, by the organization of medical help. The results were truly wonderful. Pliny says that his villeggiatura at Laurentum was equally delightful in winter and summer, while the place is now a hotbed of malaria. Antoninus Pius and M. Aurelius preferred their villa at Lorius (Castel di Guido) to all other imperial residences, and the correspondence of Fronto proves their presence there in midsummer. No one would try the experiment now.

In recent years, however, the city has again become free from malaria.

The evolution of the drainage system of Rome is typical of all growing cities. The first attempts to drain the marshes between the hills of Rome were made before the Tarquins, when the beds of the three creeks flowing between the hills were confined between banks of solid stone to prevent their overflow in flood time and when branches leading to them were dug from the swamp lands. As the need for using the lowlands increased because of the demands of communication and business, the creek channels were simply roofed over with slabs of stone, and buildings and streets were erected over them. The drains thus became *cloacae,* and their haphazard, tortuous course was a logical result of their development in the paths of the original streams. Manholes and openings were made at regular intervals; street debris, rain water and soon surplus water from the fountains and baths were led into the drains, and finally even the cesspools from the habitations on the hills were run by steep channels into them and they became sewers.

These sewers were very large. The original creek beds were left 5 feet wide, and when this channel had been converted into a sewer, it is not hard to believe Pliny when he says Agrippa rowed a boat into the Cloaca Maxima in order to examine its operation, and that this trunk sewer was big enough to drive a load of hay through it. It is strange that the Romans never straightened the courses of their sewers, but the difficulties of removing houses, tearing up streets, and even the engineering problems involved in securing good drainage with a straight course, probably kept them from the attempt.

The sewers seem to have been constructed of large blocks of cut stone. The side walls were heavy, and a stone channel was provided at the bottom for carrying the sewage. In view of the marshy nature of the ground, this stone channel was undoubtedly a necessity. Roofing over the sewers were flat slabs of cut stone. It seems probable that at least some of the larger sewers were lined with cement. Pierced manholes were provided at frequent intervals, often less than 100 feet, not only for the purpose of cleaning and repair but more importantly for the removal of surface waters. Many of these manholes were ingeniously sculptured, one in particular representing the face of Oceanus, into the mouth of which the surface drainage ran.

Lanciani is not enthusiastic over the Roman sewers:

> The Roman cloacae have been overpraised. It is certainly a marvelous fact that some of them were still in use a few

years ago, after a lapse of twenty-six centuries; but they bid defiance to modern sanitary principles. First of all, they served to carry off the sewage and the rain water together. This double employment made it necessary to have large openings along the street, which exposed the population to the effluvia of the sewers. In the third place the sewers emptied themselves directly into the Tiber, thus polluting its waters, which were used not only for bathing, but also for drinking purposes. Only six years ago did the Tiber cease to be the cesspool of Rome. It must also be borne in mind that the "latrina" of Roman houses was inconveniently placed next the kitchen, and the same cloaca was used for the sinks. Against such great dangers to public and private health the Romans had but two protections; the masses of water by which the drains were constantly flushed, and the hilly nature of the city ground, which allowed them to give the drains a steep gradient.

Exception may be taken to several remarks in this statement: firstly, it is to be doubted whether, in view of the large water supply from the aqueducts, much drinking water was taken from the Tiber; secondly, it is doubtful if the airs from the drains under the circumstances were in any manner offensive, and thirdly, the fact that the sewage in the majority of cases first passed through septic tanks, as the cesspools of the houses really were, made its mixture with the surface water in the drains of less consequence than Lanciani would have us suppose. In view of the comparative health of Rome during the Empire, the excellence of its sewage system cannot be strongly denied.

Very little is actually known of the structure or operation of the *latrinae*. From the ruins, it may be presumed that they were built as benches of brick or marble, perhaps with wooden covers, and were flushed with water from faucets. The *latrina* was usually a large single room which, with the exception of the most pretentious houses, served for all. Public *latrinae* have been unearthed in connection with the *thermae*, and these were provided with troughs constantly washed by a stream of water, in addition to the benches. In these *latrinae*, the benches seem to have been built directly over the outflow drains from the baths.

An interesting account of the well-preserved remains of a Roman latrine of about the third century A.D., at Dougga, North Africa, is given by Berry. This latrine was discovered by the side of a paved street, and was built against the wall of a large reservoir. Around three sides was a horseshoe-shaped seat 17 inches high, with a width of one foot 11 inches, formed of slabs of white limestone, and faced with polished marble. In this seat were twelve circular openings 6 inches in diameter and 23 inches apart from center to center. The openings were very close to the front edge of the seat, and in front of each was a narrow slit 2¼ inches wide running through the seat and front facing-slabs. Foot rests were provided, and a trough ran in front of the seats. Beneath the openings was a continuous sloping drain, which seemed to be connected to the main street drain. The latrine was thus a true water-closet, and was flushed either continuously from the reservoir close at hand, or at intervals by an attendant who poured water into the openings. The street drain was covered with large quadrangular stones, with circular openings every few yards, covered with smaller slabs, for in-

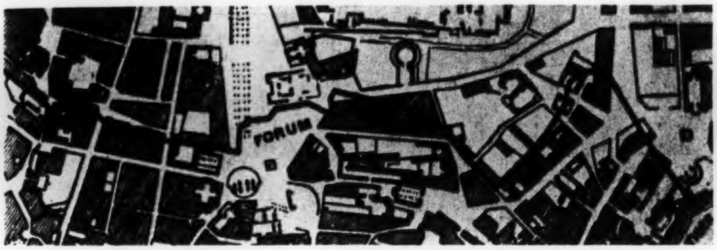

FIG. 2. MAP OF TORTUOUS COURSE OF CLOACA MAXIMA. (FROM LANCIANI.)

spection or cleaning. In front of the horseshoe seat was a large vestibule with a basin supplied by a pipe leading directly from the reservoir. Although similar in many respects to the general arrangement of our modern public toilet facilities, numerous differences are to be noted. No partitions were provided between seats, and there is no evidence that the sexes were divided. It has been surmised that the family or guests met together in this place as in a dining room. Such a custom existed in parts of France at the beginning of the nineteenth century. The circular seat openings were remarkably small in comparison with modern ones and could not have been suitable for urination. It is supposed that the vertical slit piercing the seat and the front facing served for this purpose, but whether the urine fell in front or in the drain beneath the seat, is not clear.

In the large private houses of Imperial Rome, connection was not made directly between the latrines and the sewers. In the majority of ruins found, the *latrinæ* emptied into cesspools which then communicated with the sewers. If the water flushing was sufficient to keep odors from accumulating, which in view of the fastidiousness of the Romans in these respects was most likely, this was an admirable system, providing a miniature reducing plant for sewage disposal for each house, and serving to keep the main sewers more clean. Since reference is made by Vitruvius[3] to the use of charcoal in drains, it may be supposed that the absorbent nature of this material was known to the Romans, and that noxious odors from latrines, cesspools, and drains may also have been controlled by its free use.

The drainage system of ancient Rome was the predominating factor in keeping the city relatively free from two most destructive epidemic diseases, typhoid and malaria. Unconscious though the Romans may have been of the sanitary significance of their sewage system, which is unlikely enough on the very face of it, their construction of it, combined with a huge surplus of water and a steep drainage to keep it clear and clean, is a lasting monument (some of the sewers are still in use!) to the hygienic skill of their architects and engineers.

THE WATER SUPPLY OF ROME

Quod si quis diligentius aestimaverit aquarum abundantiam in publico, balineis, piscinis, domibus, eruipis, hortis suburbanis, villis, spatioque advenientis exstructos arcus, montes perfossos, convalles aequatas, fatebitur nihil magis mir-

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[3] Lib. v, Cap. ix: Cloacis his perfectis, compleantur ea loca carbonibus.

andum fuisse in toto orbe terrarum.—Pliny (Nat. Hist., xxxvi, 24)

Our first-hand knowledge of the water supply of ancient Rome comes from an interesting treatise, "De Aquis," by Sextus Julius Frontinus, *curator aquarum*, or water commissioner of the City of Rome under the Emperor Nerva, 96–98 A.D. This has been lovingly translated and commented upon by Herschel.

A highly versatile personage, Frontinus illustrates nicely the characteristics of the average well-born Roman; his mind and works applied to the welfare of the state, his intellect displaying a splendid faculty for straight-forward unimaginative organization and an absolute lack of scientific curiosity, characteristics blamed by Wells for the downfall of Rome. According to Herschel, Frontinus was born 35 ± 5 A.D., was probably educated at Alexandria, and became a surveyor in Sicily. He went to Britain as part governor of Wales, and remains of his roads still exist there. Returning to Rome in 78 A.D., he devoted his time to writing treatises on surveying (the pioneer and standard for a thousand years), on the art of war and strategematics, on farming, roads, and on the Roman colonies. When the reform movement under Nerva followed Domitian in 96 A.D., Frontinus was called to supervise the water supply of Rome, and in 100 A.D., Trajan made him consul, after which he may have served in the German and Dacian wars.

Frontinus treats his discussion of the water supply of Rome in an historico-descriptive manner, and begins by saying:[4] "From the foundation of the city, for four hundred and forty-one years, the Romans were content with the use of waters which they drew, either from the Tiber, or from wells, or from springs." We have no means of knowing why the Romans in 313 B.C. decided that the local springs and wells were not adequate for their water supply. The natural growth of the city, the gradual pollution of the Tiber, or the closing of its banks by commerce, all these factors may have served to curtail the local supply of what Vitruvius the architect called the chief requisite for life, happiness and daily use.[5] But Rome, situated on its hills, has always had an abundance of springs in the lowlands between and it is difficult to believe that the Romans of this period began to run short of water for their daily use. The first aqueduct, built in 313 B.C. by Appius Claudius Crassus, the builder of the Appian Way, went ten miles beyond the city walls for the source of its supply. Why, if merely daily water was needed, should it have been necessary to go so far, when many brooks and springs were to be found between?

From other circumstances, these objections may be met by reference to the sanitary situation of the city at the time. Great epidemics of unknown origin had swept through Rome in 331 and 314 B.C. Without doubt, the drains through the swampy lowlands, constructed under the Tarquins, were becoming stagnant as the city grew and were not receiving from the local wells enough water as surplus to flush them clear of excreta. Moreover, the wells and springs themselves were probably beginning to get foul because of the impaired drainage. The noxious odors more quickly than anything else would have offended the Roman patrician, and would have led to his insistence upon pure water, obtained from a source as far removed from pollution as possible, and all without any thought on his part of the sanitary consequences. In the minds of the more enlightened, there may have been some vague connection between the bad drinking water and the pestilences, which would have increased the demand for purer water.

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[4] Lib. I, Cap. II.

[5] Lib. VIII, Cap. I . . . maxime necessaria et ad vitam et ad delectatione et ad usum cotidianum.

With the ever-growing needs of the city, more and more aqueducts were built, until with the completion of Hadriana under the Emperor Severus Alexander in 226 A.D., Rome was furnished with a plentiful supply of water from eleven aqueducts. Frontinus saw the operation and supervised the maintenance of nine, and these were the really important ones, the two added in the century following him being chiefly used to fill the basins in which sham naval battles were held.

During the Empire, apparently only four of these gave water pure enough to be used for drinking purposes, the others being used to keep the myriads of fountains playing, to flush the drains, and to give the baths the great amount of water they required. These four were Marcia, built in 144–140 B.C., Virgo, built under Augustus in 19 B.C., and Claudia and Anio Novus, built together between 38 and 52 A.D.

Marcia was the first aqueduct to run on a high level, and it carried cold spring water into Rome from a distance of over thirty miles. For centuries it was the favorite drinking water of the Romans and the waters of its sources still supply the city. Of Virgo, Cassiodorus said:

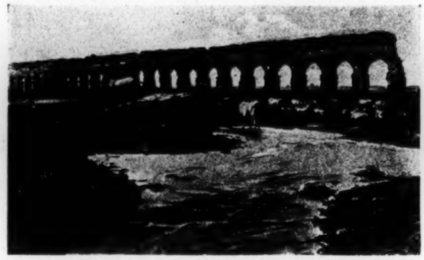

FIG. 3. RUINS OF CLAUDIAN AQUEDUCT, WITH ANIO NOVUS TOPPING IT.

> The waters of Virgo are so delightfully pure that the name is believed to come from the fact that it is sullied by nothing; for while the others show the violence of storms by their turbidity, this alone flows always serenely pure.

The springs feeding Virgo were near those of Appia, on the brook Anio, about eight miles south east of Rome. Like Appia, also, this aqueduct was not a high-level one, but began only about 90 feet above sea-level, and entered Rome only 13 feet lower, and again like Appia, was above ground but little of the distance.

Of Claudia and Anio Novus, Pliny said:

> The new aqueduct, commenced by Caligula and finished by Claudius, eclipses all before it. The waters of the Curtian and Caerulean springs, and of Anio Novus, flow forty miles, by its aid, so that they may rise to the tops of all the hills of Rome. Fifty-five million, five hundred thousand sestertii [$3,000,000] were spent on this work.

These two aqueducts took their source in the springs at the headwaters of the Anio, about thirty-five miles southeast of Rome. Large reservoirs were built, much in the style of modern waterworks, and the channels led directly off from these. Anio Novus started with an elevation of 230 feet, and entered Rome at a height of 185 feet, with Claudia 9 feet beneath it most of the way. Ample head of pressure was therefore given to rise through all the inverted syphons en route, and to bring the waters to the tops of the tallest buildings on the hills of Rome.

Passing by all the interesting features of these great structures except those that have a sanitary aspect, it should be noted first that the aqueducts of Rome were carefully protected by law from molestation. It is true, from what Frontinus says, that the object of this protection was more to prevent unlawful drawing of waters than to keep them from pollution, but the latter end was achieved anyway. About the sources of the aqueducts there was a wide restricted area in which no one was permitted to enter. Bathing in the sources was especially forbidden, and Nero incurred the hatred of his subjects by polluting, with suggestive arrogance, the waters of Virgo in this manner. Along the course of the aqueducts there was a 30 foot right-of-way on each side in which it was unlawful to plant trees, graze cattle, or have any buildings. The repair gangs were supposed to keep the grass cut short in this area, and to keep people from trespassing upon it. These laws had in mind the possible damage to the masonry of the structures and the unlawful drawing of waters, but they served an admirable sanitary function as well.

Along the course of all the aqueducts were small square boxes, called *piscinae*, which in recent excavations have been found to be filled with sand and fine gravel. From this fact, and from the sieve-like structure of the partitions separating the compartments in them, and from the flow of water through them, it is generally held that they were filters. An aqueduct of the length of Claudia would have perhaps a hundred filter boxes along its course. Herschel holds that these boxes were for the purpose of catching gravel and small stones which came rolling down the aqueducts, in order to keep them from plugging the pipes in the city. Moreover, the waters entering Rome were exceptionally hard, and he suggests that these boxes may also have served as centers for the formation of calcium deposits in the effort to soften the water. Whatever their actual intention, they served a sanitary purpose.

Among the matters which expeiience alone taught the Romans in the actual use of the aqueducts, was the fact that the waters could not be carried for long distances in closed conduits without losing the excellence of their drinking qualities. Accordingly, in all the later aqueducts, provision was made to place air-holes at regular intervals along the water channel, and indeed, wherever the aqueduct ran for a long distance above ground, it was left uncovered. Again, it was discovered that sufficient flow must be maintained to prevent the development of stagnant pools along the course of the aqueducts, otherwise the water would acquire a bad swampy taste. One would think it an easy step for the intellect to reason from a discovery like this to the drainage of naturally occurring stagnant pools, and to the elimination of the mosquito. But the Roman lacked this scientific imagination. Indeed, we have only acquired it within the last half century ourselves.

In the city, the waters from the aqueducts were led to separate distributing reservoirs, where sedimentation of foreign material could take place. The building of huge reserviors at the headwaters of the aqueducts would have this same point in mind, and, in fact, Frontinus specifically mentions them as being built to allow the water to settle before being drawn. From the distributing reservoirs in the city, the water was conducted beneath the streets in clay conduits. Where a branch went to a side-street, or to a house, lead pipes were used, and in the houses these pipes, which were inscribed with the owners' names, terminated in stop-cocks something like our modern faucets. The joints around the mains were soldered with lead to prevent leakage. The unhygienic use of lead pipes for carrying drinking water did not pass unnoticed. Vitruvius pointed out their dangers and advised the use of other materials.

An interesting thing is mentioned by Vitruvius in regard to keeping the pipes from leaking, where he advises that ashes be placed in the openings of the pipes to be carried down by the water, at intervals during the year. The absorbing powers of the charcoal and ashes would here again serve a sanitary function, although not used with that motive in mind.

Many of the poorer people could not afford to have the waters piped into their houses, but for them there were many and huge public fountains, which never stopped flowing, and from which water was drawn in large earthenware jars. All the public buildings of the cities were furnished with running water and, it is safe to say, most of the larger private houses and tenements. The water from the many fountains flowed directly into the drains, which it served to flush and keep clean.

The Romans built aqueducts on as imposing a scale for nearly all the more important towns of the Empire as for their own city. Some of these are still in use to this day. Herschel gives as one example the aqueduct of Segovia in Spain. Whatever element contributed to the building of these structures, whether pride in personal cleanliness, desire for cold good drinking water, or what not, the aqueducts must ever remain a monument to the sanitary sagacity of Rome.

In view of the remarks made by Vitruvius and by Frontinus, however, it is hard to believe that the Romans were as unconscious of sanitary principles as some authorities would have us believe. Karl Sudhoff says, for example, that the hygienic aspects of Roman architecture produced without intention results of medical value, but of non-medical origin, and that they were fostered chiefly by vanity and loathing of dirt. It is probably true that they were not suggested by medical men, but it is to be doubted that the Romans were ignorant of sanitary principles in their engineering triumphs. Frontinus, for example, in the second sentence of his treatise shows that he realized the sanitary aspects of his position, when he speaks of his office contributing to the convenience, *health*, and even the security of the city, against fire presumably.[6] Again, when he speaks of the repairs he made in the aqueducts so that their normal flow of water was restored and the surplus again sufficient completely to flush the drains, he says:[7]

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[6] . . . tum ad usum tum ad salubritatem atque etiam securitatem urbis pertinens.

> This care will be more apparent in the health of the city, because of the increased number of tanks, fountains, and basins in service, not even the waste water is lost; the city is cleaner, the air is purer, and the causes of the plague, which gave the city so bad a name among the ancients, are removed.

It is highly probable that the reforms of Frontinus cut down the prevalence of typhoid, whereas the plague he refers to as giving the city a bad name in former times may have been malaria. From these passages and from others in Vitruvius, it may be said that the sanitary aspects of Roman engineering were not entirely unintentional.

Among the popular beliefs of ancient Rome was one to the effect that the water of the Tiber was of especial wholesomeness and excellent for drinking. Indeed, in later years it became the favorite beverage of several of the popes, proving no more, as Lanciani points out, than that they were immune to typhoid. Even if they drew their water above the city, it must have been already polluted by farms along its course.

It might be interesting in concluding the discussion of the water supply of ancient Rome to compare it with that of modern cities. In spite of all the argumentation about the figures given by Frontinus, it is generally accepted that about 84,000,000 gallons per day were delivered to Rome by the nine aqueducts. Counting only the efficient delivery of 68,000,000 gallons per day, which is perhaps a fair figure in view of leakage and unlawful taking of water, the aqueducts furnished thirty-four gallons per day per person, when the population of Rome was at its height. Sir Clifford Allbutt has said that no modern city gets one-tenth the water supply of ancient Rome. This statement cannot apply to large cities in the United States, one of which (Chicago), for example, receives over 200 gallons per capita per day, much of this, however, for industrial purposes.

THE ROMAN BATHS

Who would not consider himself a beggar if he bathed in a room whose walls did not shine with the fire of jewels; if the marble of Egypt were not inlaid with the marble of Numidia and panelled with mosaics; if the ceiling were not wainscoted with crystal; if the tanks were not carved out of Parian marble; if the water did not flow from silver faucets? And yet I am speaking only of the baths of the people.—Seneca (Epist. 86)

More appropriate than "baths" as a name for the great *balneae* and *thermae* of the Republic and Empire of Rome would be the term "gymnasiums," since, being modeled after the Greek institutions of the same names, these structures were as much a place for exercise and athletic training as for bathing. During the Republic they were plain and unpretentious buildings, serving a very utilitarian purpose, but with the magnificence of the Empire, they became not only the most ornate, but also the largest of the great public buildings of Rome.

The general plan of these gymnasiums centered about a large open space, the *palaestrum*, which in the Greek originals was the training arena where the athletes exercised. About this central courtyard, which later became more of a promenade than a training field, the rooms of the baths were grouped. These were the *coryceum*, a room where pugilists practiced by striking at hanging bags of sand; the *calidarium*, a hot room, with the hot bath; the *tepidarium*, where the water was warm; the *frigidarium* or cold room, where there was also a swimming tank; the *elaeothesium*, which was a room where the patrons were anointed with oils and perfumes, and the *apodyterium*, or dressing room. There were at first separate baths for women and men, with separate entrances, dressing rooms and attendants. Later, promiscuous bathing came into vogue, to be prohibited by Marcus Aurelius, after which the sexes bathed on separate days, but with the same slave attendants.

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[7] Lib. II, 88.

Only the more wealthy of the Romans had bathtubs in their own houses, and yet, from the large number of marble tubs unearthed, it may have been possible that the great tenements or rooming houses of the city were also supplied with them. But for the poorer people and the general masses the great public baths had to suffice. Admission was free to children and to some travellers, while from the rest of the patrons only a nominal fee was required. The baths usually represented a philanthropic enterprise on the part of the Emperors, and by this circumstance were furnished in the lavish and luxurious manner which has made them so famous.

While the smaller public baths, such as those found in Pompeii, were situated in the center of a business square, with shops around them facing the streets, the large open *palaestra* admitted plenty of light and air to the bathing rooms. In conformity to their use as places of exercise, all the rooms but the *calidarium* were so arranged, customarily, that at least one whole side, and perhaps even the roof, could be thrown open. In view of our present knowledge of the beneficial action of sunlight and fresh air in rickets and tuberculosis, the bathing arrangements of the Romans, where the whole surface of the body was exposed to the action of sunlight and air, were admirably adapted to serve as prophylactic agencies against these diseases.

The methods employed to heat the warmer rooms of the *thermae* are interesting from the fact that the heat was indirect and the bathers were not exposed to sudden heated blasts of air. The floors of concrete and marble were hung over the *hypoçausti*, or air spaces above the furnaces, the flues of which then ran upwards through the walls of the room. In this way, both the water in the tanks or *labra*, and the air in the room were uniformly heated. The hypocausts were so built that the hottest fires were beneath the baths. With a greater air space in the hypocaust beneath the floors, these were maintained at a more reasonable temperature. The arrangement of the furnaces beneath the water tanks served admirably to maintain adequate humidity in the great buildings. This is a feature too often neglected in our modern large public buildings in which the dryness of the atmosphere contributes materially to nose and throat discomfort, and to the development of inflammation and disorders of the mucous membranes of the respiratory tract.

The protection afforded the Roman bathers from blasts of dry superheated air, which is so bad a feature of some of our modern hot-air furnaces, must have been a considerable factor in reducing the liabilities of taking cold or pneumonia. There is no evidence to show that the Romans ever superheated either their homes or public buildings, except these hot rooms of the baths, which were for the purpose of inducing profuse perspiration, and were sometimes called *sudatoria*. The type of clothing, the frequency of exercise and cold bathing, and the avoidance of large differences of temperature between the inside of a house and the outside air were factors which might have aided in reducing the prevalence of colds and pneumonias among the ancient Romans.

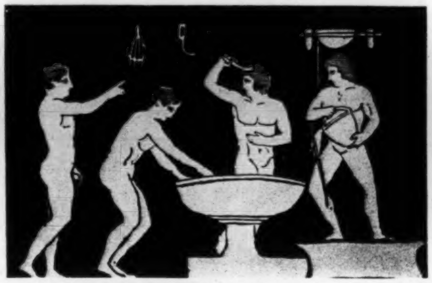

FIG. 4. SCENE AT "MEN'S BATHS, FROM VASE IN HAMILTON COLLECTION. NOTE COMB AND SCRAPING INSTRUMENTS. (FROM HERSCHEL.)

From the descriptions, it seems that the water was in constant circulation through the bathing rooms from one tank or *labrum* to another, and was supplied from huge cauldrons or brick chambers in which it was heated by separate furnaces. In smaller baths, the water was probably brought by attendants and placed in the proper *labrum* for use by the bathers. From the huge water supply of the city there is no ground for believing that, except in the swimming tanks, the same water served for the ablutions of several persons.

The characteristic structures for public bathing and exercise were by no means limited to the Imperial City itself. Remains of baths have been found in many widely scattered Roman colonies. Apparently, the Roman was fastidious and careful about his personal cleanliness and habits no matter where he went, nor to what hardships of frontier existence he was forced. A well-preserved portion of a Roman bath is still to be seen in London, and has been mentioned by Dickens in "David Copperfield." This bath was fed by the waters from a natural spring, and judging from the size of the remains, there must have been a considerable flow of water.

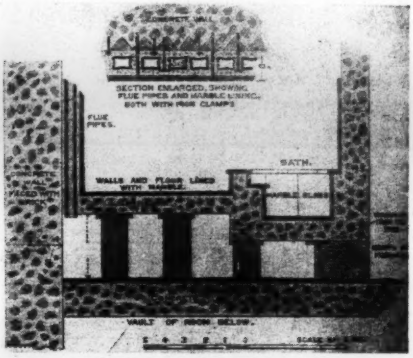
CONCRETE WALL
SECTION ENLARGED, SHOWING FLUE PIPES AND MARBLE LINING, BOTH WITH IRON CLAMPS
FLUE PIPES.
BATH.
WALLS AND FLOOR LINED WITH MARBLE.
CONCRETE WALL FACED WITH BRICK
MARBLE SLABS
VAULT OF ROOM BELOW.
5 4 3 2 1 0

FIG. 5. DIAGRAM SHOWING CONSTRUCTION OF HEATING SYSTEM FOR ROMAN BATHS. (FROM MIDDLETON.)

Besides bathing, exercise and massage, the great public baths or gymnasiums served many other minor medical functions. They were the ancient barber shops and beauty parlors, as well as Turkish baths, and if we may judge by modern establishments of a similar nature, much therapy and pseudotherapy of a dermatological character must have been practiced in them. Mere bathing for the Romans was by no means the simple process it is with us. Soap was unknown but scraping, kneading, oiling and rubbing were employed, besides perfuming, plucking of hairs and powdering with ground chalk. It is probable that boils were lanced and bandaged, pimples, warts and moles removed, alopecia and dandruff "cured," and various skin diseases treated just as they are today.

It is significant of the sanitary architectural science of the Romans that the rooms of their baths should be finished in marble, a substance capable of taking a hard glistening polish, and of being kept clean with ease. The basins, tanks, floors, walls and ceilings of the baths were all marble finished, and even the benches were of this material. Our recent lavishness of the use of marble in our barber shops and soda fountains has cleanliness in mind, perhaps, but too often is real dirt disguised behind the glitter of white enamel and of the brilliant lights and mirrors which accompany it. In the Roman baths, with mirrors, tables, benches and basins not fastened in structural combination to the building, cleanliness was perhaps more easily secured.

The use of marble in Roman buildings was due to the influence of Agrippa (63–12 B.C.), son-in-law and administrator for Augustus Caesar. He was the first permanent water commissioner of the city, and as such, probably had occasion to note daily the superiority of marble to brick in all buildings where water was a conspicuous feature. He has been called the greatest of Roman builders, and the "principal instrument for changing Rome from a city of brick to a city of marble."

THE CONTROL OF FLOODS AND FIRES

All the leechcraft possible falters at the task of relief.—Ammianus Marcellinus.

In days of the Republic, when Rome was many feet lower than it is now (the accumulation of debris has raised the level of the Forum over 40 feet), the frequent inundations of the Tiber caused much suffering, famine and disease. The early drainage of the marshes helped to control the floods, but it was found increasingly necessary to confine the Tiber itself to a fixed channel. The Emperors did everything they could to reduce the danger of floods. Augustus created a special administrative department for the control of the river, and both Claudius and Trajan built drainage canals from the city to the sea. The river was banked with low dikes built in three terraces, a much more satisfactory arrangement than the present, confined as it is, between unsightly high walls. But in spite of every precaution, scarcely a decade passed without at least one devastating flood, which would sweep away the booths and shops in the lowlands near the river, spoil the food in the granaries along its banks, and lead to famine and disease among the poor.

In spite of the fact that most of ancient Rome in the Empire, as we know it, was built of brick, stone or marble, there must have existed throughout the city veritable fire nests to provide fuel for the several great holocausts of which we have records. Friedlander places the fire blame on the construction of flimsy tenements:

> Most of the lodging-houses were jerry-built by speculators, an attractive but risky game; it might be very profitable but for the frequent fires that consumed the capital. The contractors, therefore, no doubt aimed at building in such a style as to make a few years' rental exceed or at least repay the capital expenditure.

They exploited the ground, not only by building as many storeys as possible, but also by cutting down the size of single rooms, and reducing repairs to the least possible; a manner of building, which also, on its part, considerably increased the danger of fire. The thin partitions and walls of these piled-up lodging-houses provided no sufficient protection against heat or cold, and were made of wood or panels; lattice-work was in especial favor; it looked seductive from the outside, and thus answered the speculator's purpose all the better; but it materially warped the solid fabric, as the walls would tend very easily to burst or split.

Furthermore, little headway could ever have been made in fighting fires in ancient Rome because of the narrowness of the streets, the height of the buildings, and the serious lack of hoses and pumps. Augustus organized a fire brigade of 7000 men, but apparently it was of little avail in stopping the spread of flames once they gained headway.

After each fire, with the destruction of homes, food and clothing, great epidemics, probably of typhus, followed as a matter of course, aggravated by famine and exposure. Against such calamities even the practical Romans had no more satisfactory protection than supplication to the gods, and the fact that an occasional Emperor, like Domitian, would rebuild and beautify in stone and marble.

Roman architectural hygiene failed sadly to cope with the two terrors of fire and flood. This is somewhat surprising in view of the practical skill displayed by the engineers in solving the more difficult questions of water supply and drainage. Perhaps it was because the suffering and loss of life following a flood or fire was confined chiefly to the poorer and more ignorant masses.

The Columbaria

According to the law of the XII *tables, which mentions both burning and whole interment, burial within the walls of Rome was strictly prohibited.*—Middleton.

For tracing the paths of wandering peoples, or the origins of ancient races, nothing is more valuable to the archeologist than the burial customs, because of the tenacity with which the particular ritual of each tribe hangs on. In Rome, for example, it is believed that fair-haired northern tribes, who burned their dead, were the conquerors of swarthy, more slender aborigines who buried theirs; the former becoming the patricians and the latter the plebians, with considerable admixture. The same condition had previously come to pass in Greece. The practices of the ruling classes were imitated more and more by the mass of the people, until in Rome we find cremation almost universal by the time of the Empire. A notable exception was the *gens* Cornelia, probable descendants of the aboriginal rulers, to which the Scipios belonged, who for centuries buried their dead, public custom to the contrary.

Notwithstanding, then, the general approval of the sanitary method used by the Romans to dispose of their dead, it had its origin, not in rational medical ideas, but in unknown and mystical religious beliefs. But the edict against burial within the city walls may have originated more from a sanitary motive, or from the utilitarian one of using all available ground for practical purposes.

The disposal of the Roman dead took place along the many roads leading from the city, where those who could afford it had a tiny plot of ground on which the funeral pyre was built, and on which stood a marble vault for the reception of the ashes. The poorer free majority belonged to various funeral guilds which owned a larger piece of ground and had a huge burial chamber built into the side of a hill, or partly below ground. Many purchased burial rights from commercial companies. Slaves were cremated and buried in their master's vault.

The usual type of cooperative or commercial burial chamber was a large room with small niches like pigeon-holes all over the walls, and the name, *columbarium*, was taken from its resemblance to a dovecot. In these niches the vases containing the ashes of the dead were placed.

From their sanitary aspects, the Roman burial customs were excellent. Cremation usually took place within twenty-four hours of death. Being considerably removed from the city, and because of the intense heat of the huge pyres in the open air and the use of perfume, there was no occasion for offense because of odor. In times of pestilential epidemics this method of handling the dead could have been, and probably was, so enlarged as to become a considerable factor in reducing the prevalence of the disease. Certainly, from a medical standpoint, it is to be preferred to our method of burial, usually on a hillside in proximity to a source of drinking water.

The Christian ascendancy, however, disapproved of cremation, because of the primitive animistic belief of St. Paul in the resurrection of the body itself, and hence the burial of the body again came into fashion. There was gross violation of sanitation in connection with this, with the crowding of the city, which forced many old graves and vaults to be opened and filled to overflowing with new corpses.

THE DWELLINGS

Dove non va il sole, va il medico (*Where sunlight enters not, there goes the physician*).—Italian Proverb.

Perhaps no feature of Roman architecture had a greater sanitary consequence than the sensible construction of the houses. This was a feature that reached the remotest hamlet. The aqueducts and drains were too costly to build except in the larger cities. The baths, from an excellent beginning as gymnastic and training centers, deteriorated rapidly during the Empire to general lounging places, where often the entire day would be spent in debilitating hot baths and sweating chambers, with a luxurious accompaniment of singing, reading and dancing, and without the invigoration of the exercises formerly participated in. The sanitary features of the *columbaria* and of the health centers were again to be found only in the largest centers of population. But the type of dwelling house built by the Romans was common to the whole Empire, differing only slightly, as Vitruvius points out, according to climate and temperature.

The most distinguishing characteristic of the Roman house from a medical standpoint was the open central courtyard, about which the rooms were built and toward which they opened. This open reception room, or *atrium*, was built so that the roof could be thrown back to the sky, and an abundance of fresh air and sunlight admitted to the dining and sleeping rooms grouped about it. These rooms were also frequently provided with roof openings for better ventilation and the admission of sunlight. In addition, most houses had a peristyle, or garden, wide open to the sky, and with a promenade and rooms built around it. Even in farm houses, the *atrium* was still retained.

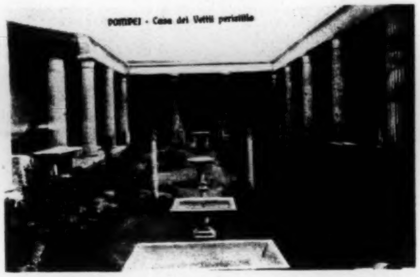

Fig. 6. Peristyle of House of the Vettii at Pompeii. Arrangement of Rooms About an Open Court is Indicated.

The hole in the roof over the *atrium* is condemned by Jones as an unsanitary feature of the Roman homes, on the ground that it admitted rain which collected in a small cistern beneath the floor. This cistern, or *compluvium*, would then become a pool of stagnant water, admirably adapted for a breeding place for mosquitoes. Upon this possibility, Jones advances claims for the prevalence of endemic malaria throughout Italy. In view of the fact that most of the *atria* contained fountains, which threw out a considerable amount of water, it seems that some provision must have been made to drain the *atria*, and this would have prevented the breeding of mosquitoes in these places.

The kitchen, bath and latrine were usually grouped together at one corner of the house, to effect economy of drainage and water. Since they were separate rooms, and the drains were provided with special stopcocks for their adequate flushing, it cannot be claimed that this arrangement was a violation of hygienic house-planning. The cooking was done over an open hearth in one corner of the kitchen, and so far as the ruins go, this seems to have been the only place in which heat was constantly maintained in the whole house. The bath water was heated by flues from this fire, and the construction of the chimney, as in the case of the public baths, may have served to warm the bathroom. Open fires were built in the *atria* on special platforms, but this would have but little effect in warming the rooms of the house. Braziers, of course, were used in the rooms, but these could not have given very great heat without too much discomfort.

The climate of ancient Rome was certainly not warmer than it is now, and indeed, evidence shows that it must have been colder, for several writers speak of snows in the city, whereas now it seldom freezes there. The lack of superfluous heat in the houses may have helped to maintain that vigor and endurance of the Romans, so prized by the sterner patricians.

The choice of a site for a country house was the subject of careful discussion by several authors. Varro, in his first book on farming, says:

> You must be careful to place the farmhouse at the base of a well-wooded mountain, the best situation, with the farmyards below it, and see that it face the healthiest winds which blow in the district. The farmhouse which faces the equinoctial East has the best exposure, for it has shade in summer, and in winter gets sunshine.

Vitruvius applies to farmhouses the same splendid rules he outlines for the choice of a building site for a city.

In the city, house-planning from a hygienic position was more difficult because of the crowding. Indeed, many foul and dingy fire-traps sprang up as tenements in Rome, and Friedlander paints a lurid picture of the misery and squalor of the slums, which he seems to think constituted almost the entire city. Vitruvius, however, realized the value of light and air, and endeavored to show how buildings could be erected in the city so that the rooms would get as much sunlight as possible:[8]

> We must take care that all buildings are well lighted, but this is obviously an easier matter with those which are on country estates, because there can be no neighbor's wall to interfere, whereas in town high party walls or limited space obstruct the light and make them dark. Hence we must apply the following test in this manner. On the side from which the light should be obtained let a line be stretched from the top of the wall that seems to obstruct the light to the point where it ought to be introduced, and if a considerable space of open sky can be seen when one looks up above that line, there will be no obstruction to the light in that direction. But if there are timbers in the way, or lintels, or upper stories, then make the opening higher up and introduce the light in this way. And as a general rule, we must arrange so as to leave space for windows on all sides on which a clear view of the sky can be had, for this will make our buildings light and clean. Not only in dining rooms and other rooms for general use are windows very necessary but also in passages, level or inclined, and on stairs.

Vitruvius elsewhere described how the lofty crowded city tenements should be built of brick and stone for strength and protection against fire.

One important feature of the larger private houses and of the great tenements was the *valetudinarium*, or isolation room, to which the sick of the household were taken for rest or cure. The protection thus afforded in the segregation of infectious diseases must have aided in preventing the spread of epidemics.

Much criticism has been directed at the Roman method of placing the latrine and bath next to the kitchen. From all the evidence, however, in connection with the water supply and the complete flushing of the drains, nothing indicates that this was an unsanitary device. After the fall of the Empire until the eighteenth century in France, private houses ceased to have private privies, and excreta were dumped unceremoniously on the nearest bit of land or in the streets. Francis I was the leader in reform in ordering that houses in Paris be provided with privies, and only later were these equipped with flushing devices. Even as recently as 1915 one of the leading English authorities on the construction of small houses advocates the building of the bath tub in the kitchen flush with the floor, so that it may serve either as an auxilliary drain, or as a storeplace for vegetables and food. The Romans, with a separate bath room, were at least a step in advance of this.

In connection with house sanitation, it might be of interest to speak of the laundry work of ancient Rome. This was universally in the hands of the fullers whose shops were among the most numerous in the cities. Soap was not introduced from Gaul until the end of the first century and then but slowly. Working in large open courts, the fullers passed the clothing bundles through a series of tubs containing running water, and rubbed and pressed fuller's earth into them with both hands and feet. After thorough rinsing, the clothes were hung over wire frames in the sun to dry, and all the while, we may infer, the fullers were gossiping merrily about the affairs of the patrons whose clothes they washed, if we are to be guided by the symbol of the craft, the parrot. It was apparently one of the largest trades in the Empire. The fullers' shops were constructed with the demands of the business in mind, and were provided with a large supply of water and a complete drainage system.

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[8] Lib. VI, Cap. IX.

The food of Rome was an ever-pressing and intricate problem, necessitating the erection of huge warehouses all along the Tiber, even to its mouth, nine miles away. The warehouses were built of stone or marble, sometimes with double walls and ceilings, and with no windows. In spite of small rooms and constant precautions, great quantities of food continually spoiled and had to be thrown into the river. It seems to have been inspected at regular intervals before being issued in the name of the Emperor to the people.

The chief food of the masses was "corn" imported from Egypt and Africa, and it is difficult, in light of the monotony of the diet, to avoid the conclusion that many of the populace must have suffered from the so-called deficiency diseases. This is the more probable also, because of the relative absence of fresh animal and vegetable food products in the city. It is true that large cattle and vegetable markets flourished in the city, but it is hard to conceive how they could have supplied the needs of two million people. Yet fresh farm products could not have sold at a premium, nor could the populace have greatly prized them, for Vergil makes Tityrus in the first Ecologue complain:

> Many a rich milk cheese to a thankless city I bore,
> Homeward ever I came with a purse unfilled as before.

No attempts were made, so far as is known, to store or preserve fresh animal foods, except in the case of smoking and salting fish and meat. Animals and vehicles, except for the Emperor, were frowned upon in the streets of Rome, and it is difficult, for example, to figure how the city was supplied with fresh milk.

THE SHIP OF AESCULAPIUS

Huius exemplar est in insula Tiberina.
—Vitruvius (Lib. III).

For physicians there should be no more interesting ruins in Rome than those of the Island of the Tiber, which Livy says was formed from corn thrown into the river at the time of the expulsion of the Tarquins. About 293 B.C., in desperation during a pestilence, the Romans adopted Aesculapius, the Greek god of medicine, as one of their chief deities, and erected to him a great temple on this island. Serpents, the traditional companions of the god, were secured from the great health center sacred to him at Epidaurus, and legend presently made the story given to us by Livy that the god himself came on a ship to Rome in the form of a serpent. The island in the Tiber became the chief hospital or sanitarium of the city, and was richly adorned with temples and resting places for the sick, while shops for the sale of votive offerings in the form of terra cotta or even golden representations of parts of the body were established at the entrances to the bridges leading to the island.

Later the whole island was cut into the form of a huge ship, when and by whom is not known. Called the Ship of Aesculapius and probably symbolizing the journey of the god from Epidaurus, it was nearly 900 feet long and about 240 feet wide. Perfect in every detail, even to a huge mast, it seemed to be floating on the Tiber.

To this great temple of health the Romans came to be cured for all kinds of diseases. The general plan of the ship was on the order of the sacred health grove at Epidaurus, and consisted of a central temple to Aesculapius, with smaller temples around it, in which medicinal baths and curative measures could be applied. The therapy practiced was highly psychic and superstitious, but undoubtedly efficacious in many cases. The votive offerings to the god in return for help were similar to those offered in the classic Greek shrines. In Walter Pater's "Marius," there is an excellent description of what a sojourn at an Aesculapian temple was like.

The Pons Fabricius to this island, although built in 60 B.C., is the only Roman bridge across the Tiber still in use. Fabricius had to give a deposit against possibility of the bridge falling, which was only returned to him after a trial of forty years. Testimony is here given both to the hard use expected to be given to the bridge, and to the skill with which it was built to prevent any disaster.

No better account can be given of the establishment of the worship of Aesculapius in Rome than Crawford's:

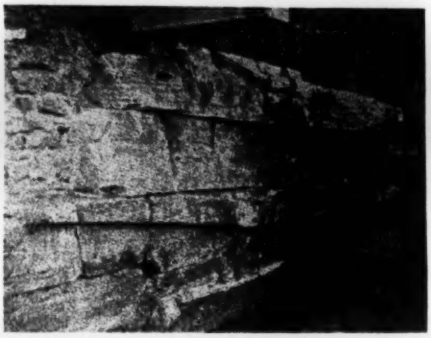

FIG. 7. STERN OF "SHIP OF AESCULAPIUS" IN 1890. NOTE STAFF AND SERPENT. (FROM LANCIANI.)

A violent pestilence drove the magistrates to consult the Sibylline books, and in obedience to their instruction ambassadors were sent from Rome to Epidaurus to demand the serpent of Aesculapius, in which the god seemed to be incarnate. At first nothing was done beyond devoting one day to the supplication of Aesculapius. But in the following year ambassadors set out under the leadership of Quintus Oculnius and on arrival at Epidaurus were taken to the temple of Aesculapius, and invited to carry away whatever was needed to rescue their city from pestilence. Thereupon the serpent, which rarely appeared to the Epidaurians, presented itself for three days in the most public parts of the city, and then of its own accord made its way to the Roman galley, in which it was transported to Antium, after the ambassadors had been instructed how to pay honour to the god. After a brief sojourn there it re-entered the Roman galley, and scarce had they reached the Tiber, when it swam to the island in mid-stream, where a temple was dedicated afterwards to Aesculapius. A coin of Commodus and a medallion of Antoninus survive to commemorate the event. To this day there may be seen on some large blocks of stone, moulded to the shape of the poop of a ship, on the Isola Tiberina, the head of an effigy of Aesculapius in relief, with the serpent twined round his staff. So it was pestilence that brought Aesculapius to Rome, as it had brought Apollo before him. In this temple in the Tiber the healing ritual of the god flourished for some centuries, and in recent excavations many votive emblems of diseased parts of the body have been brought to light. With few intervals, and those of no long duration, the island has been dedicated to works of healing down to the present day. Claudius ordained that sick slaves should be exposed on the island, and those that were to receive their freedom. The hospital of S. Giovanni Calabita, founded in 1575, stands there still. In 1656 the whole island was converted into a lazaretto for the victims of the plague.

It may have been possible that the existence of medicinal springs on the island led to its use as a health center. Many such springs existed about Rome in the early days. Frontinus says:[1]

> Springs have held, down to the present day, the name of holy things, and are objects of veneration, having the repute of healing the sick; as for example, the springs of the Prophetic Nymphs, of Apollo, and of Juturna.

The use of the Tiber water itself for bathing the sick, in connection with its commonly believed wholesomeness, may have been a factor in the building of this municipal sanitarium.

An isolated health center of the sort furnished by the Ship of Aesculapius must have served an excellent sanitary function, especially in epidemics, since the sick went there, and stayed there until either cured or dead, thus reducing greatly the opportunities for spreading the infection.

The best account of the Island of the Tiber is given in the profusely illustrated monograph of Besnier. He discusses in detail the many possible reconstructions of the temples of the island, and indicates what their present remains may be.

It is interesting that this island seems always to have been devoted to medicine. Serving for centuries as a typical Aesculapian temple, as numerous "ex-votoes" recovered from its vicinity in the river indicate, it was maintained as a monastic "hospice" or sick-resort in the Christian era. The temples were rebuilt as a monastery sacred to St. Bartholomew. It was here, in the twelfth century, that the Norman monk, Rahere, rested on his return from a pilgrimage to Palestine, vowing that if he were spared to return to England, he would build a "hospice" to the glory of St. Bartholomew. This he did in 1123, not only making "Old Bart's" of London the oldest English hospital, but linking it directly with the ancient Greek temples of Aesculapius.

The monastery of St. Bartholomew is still on the island, although its ancient glory and value seem to have been lost. Silt has piled up about the island and now even the few fragments of its poetic past which were photographed at the beginning of the century have disappeared.

THE MEDICAL KNOWLEDGE OF ROMAN ARCHITECTS AS EXEMPLIFIED IN VITRUVIUS

Apart from the writings of a private litterateur like Celsus, the principle Roman contribution to medicine was the splendid sanitary engineering of the architect Vitruvius.—Fielding H. Garrison.

Living in the century preceding Christ, Vitruvius was a cultured and well-educated architect who served as a military engineer under Julius Caesar in 46 B.C., and as a consulting architect under Augustus. He is the only Roman architect whose written works have come down to us. These are contained in his "De Architectura Libri Decem," a scholarly and interesting treatise which has been ably translated into English by the late Professor Morgan of Harvard. In the original, it was dedicated to the Emperor Augustus as an aid to him in his building enterprises. Giving general statements covering every form of activity in which the builder could be professionally interested, much of the scientific knowledge of the times, especially that transmitted by the Greeks, is touched upon. A little uncertain in his theoretical discussions and liable to wander off into an entertaining anecdote, Vitruvius is much more definite and at home in the concrete practical problems he attacks. He illustrates well the transition that Greek culture underwent at Roman hands.

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[1] Lib. I, vi.

Sensible of the fact that an architect required a very broad cultural background, Vitruvius devoted considerable attention to explaining the education demanded of him. Since this work was intended for the Emperor's eyes, it is possible that Vitruvius wished a standard training prescribed for architects. Nothing better illustrates the character of Vitruvius than his own words in this connection:[10]

> The architect should be equipped with knowledge of many branches of study and various kinds of learning, for it is by his judgment that all work done by the other arts is put to test. This knowledge is the child of practice and theory. . . . In all matters, but particularly in architecture, there are these two points: the thing signified, and that which gives it its significance. That which is signified is the subject of which we are speaking; and that which gives it its significance is a demonstration on scientific principles . . . One who professes himself an architect should be well versed in both directions . . . Let him be educated, skilful with the pencil, instructed in geometry, know history, understand music, have much knowledge of medicine, know the opinions of the jurists, and be acquainted with astronomy.

Vitruvius then gives his reasons why all this training is necessary, saying, in the case of medicine: "The architect should have a knowledge of the study of medicine on account of the questions of climate, airs, the healthiness and unhealthiness of sites, and the use of waters." These passages illustrate considerable analytical ability on the part of Vitruvius with respect to the significance of scientific principles and methods, and furnish us a fair example of the scientific ideals of the practical Romans.

The shrewd practical wisdom of the Romans is demonstrated in Vitruvius' discussion of propriety, in a way that casts much light on the manner in which the more enlightened patricians viewed some of the superstitions connected with current therapy;[11]

> Propriety will be due to natural causes, if, for example, in the case of all sacred precincts we select very healthy neighbourhoods with suitable springs of water in the places where the fanes are to be built, particularly in the case of those to Aesculapius and to Health, gods by whose healing powers great numbers of sick are apparently cured. For when their diseased bodies are transferred from an unhealthy to a healthy spot, and treated with waters from health-giving springs, they will the

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[10] Lib. I, Cap. i.

[11] Lib. II, Cap. ii.

> more speedily grow well. The result will be that the divinity will stand in higher esteem and find his dignity increased, all owing to the nature of his site.

In the phrase "apparently cured," Vitruvius smilingly enough proves that he had grasped the full significance of the *vis medicatrix naturae*, gleaned probably from a study of Hippocrates.

Scattered all through the ten books of Vitruvius one strikes many passages revealing a deep insight into medical problems, and often a few remarkable expressions of cleverness in their solutions, most of these taken from Hippocrates and other medical writers. Some of the more prominent of these will be indicated.[12]

With regard to the influence upon public health of the site of a city, Vitruvius says:[13]

> First comes the choice of a very healthy site. Such a site will be high, neither misty nor frosty, and in a climate neither hot nor cold, but temperate; further, without marshes in the neighborhood. For when the morning breezes blow, if they bring with them mists from marshes and, mingled with the mist, the poisonous breath of the creatures of the marshes to be wafted into the bodies of the inhabitants, they will make the site unhealthy.

This is rather interesting with regard to the knowledge of the Romans concerning malarial or other fevers. Vitruvius continues with a remarkable digression in which perhaps one of the earliest references is made to the use of animal experimentation for medical or public health purposes:

> I cannot too strongly insist upon the need of a return to the method of old times. Our ancestors, when about to build a town or an army post, sacrificed some of the cattle that were wont to feed on the site proposed and examined their livers. If the livers of the first victims were dark-colored or abnormal, they sacrificed others, to see whether the fault was due to disease or their food. They never began to build defensive works in a place until after they had made many such trials and satisfied themselves that good water and food had made the liver sound and firm. If they continued to find it abnormal, they argued from this that the food and water supply found in such a place would be just as unhealthy for man, and so they moved away and changed to another neighborhood, healthfulness being their chief object. That pasturage and food may indicate the healthful qualities of a site is a fact which can be observed and investigated in the case of certain pastures in Crete, on each side of the river Pothereus . . . There are cattle at pasture on the right and left banks of that river, but while the cattle that feed on one side have the usual spleen, those on the other side have no perceptible spleen. On investigating the subject, physicians discovered on this side a kind of herb which the cattle chew and thus make their spleen small. The herb is therefore gathered and used as a medicine for the cure of splenetic people . . . From food and water, then, we may learn whether sites are naturally healthy or unhealthy.

Conjecture is impossible regarding what "kind of herb" could have had so wonderful an effect upon the spleen. It may have been spleenwort, *Asplenium ceterach*, recommended by Dioscorides, Galen and Paul of Aegina. The passage is interesting, however, because of the essential correctness of the scientific procedures involved. The step concerned in the sacrifice of other animals to ascertain whether the abnormality found in the first was due to disease of that one individual or to a general condition acting upon all in the vicinity, is a process in the method of science not usually accredited to the Romans.

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[12] Most of the translations used are taken from Professor Morgan's excellent work, and acknowledgement is herewith made for this valuable assistance. (M. H. Morgan: Vitruvius; Ten Books on Architecture, Harvard Univ. Press, 1914.)

[13] Lib. 1, Cap. iv.

Respiratory infections are among the most common to humanity. In discussing the "Directions of the Streets, and the Winds." Vitruvius refers to them in a manner illustrating the pathological conceptions of the Pneumatists:

> They [streets] will be properly laid out if foresight is employed to exclude the winds from the alleys. Cold winds are disagreeable, hot winds enervating, moist winds unhealthy . . . By shutting out the winds from our dwellings, therefore, we shall not only make the place healthy for people who are well, but also in the case of diseases due perhaps to unfavorable situations elsewhere, the patients, who in other healthy places might be cured by a different form of treatment, will here be more quickly cured by the mildness that comes from the shutting out of the winds. The diseases which are hard to cure in neighborhoods such as those to which I have referred above are catarrh, hoarseness, coughs, pleurisy, consumption, spitting of blood, and all others that are cured not by lowering the system but by building it up. They are hard to cure, first, because they are originally due to colds and chills; secondly because the patient's system being already exhausted by disease, the air there, which is in constant agitation owing to winds and therefore deteriorated, takes all the sap of life out of their diseased bodies, and leaves them more meagre every day. On the other hand, a mild air, without draughts and not constantly blowing back and forth, builds up their frames by its unwavering steadiness, and so strengthens and restores people who are afflicted with these diseases.

From extracts such as this it is evident that Vitruvius was thoroughly acquainted with the current medical opinions of his day. The list of diseases is noteworthy in view of the sequence of symptoms preceding an apparently acute tuberculosis.

Contrary to Garrison's statement that Albrecht Dürer in his remarkable woodcuts was the first to apply anthropometry to the esthetic evaluation of the human body, it may be claimed that Vitruvius was, as the following passage may indicate:[14]

> On Symmetry in Temples and in the Human Body . . . For the human body is so designed by nature that the face from the chin to the top of the forehead and the lowest roots of the hair, is a tenth part of the whole height; the open hand from the wrist to the tip of the middle finger is just the same; the head from the chin to the crown is an eighth, and with the neck and shoulder from the top of the breast to the lowest roots of the hair is a sixth; from the middle of the breast to the summit of the crown is a fourth. If we take the height of the face itself, the distance from the bottom of the chin to the under side of the nostrils is one-third of it; the nose from the under side of the nostrils to a line between the eye-brows is the same; and from there to the lowest roots of the hair is also a third, comprising the forehead. The length of the foot is one-sixth of the height of the body; of the forearm, one-fourth; and the breadth of the breast is also one-fourth. The other members of the body, too, have their own symmetrical proportions . . . Then again, in the human body, the central point is naturally the navel. For if a man be placed flat on his back, with

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[14] Lib. III, Cap. I.

his hands and feet extended, and a pair of forceps be centered at his navel, the fingers and toes of his two hands and feet will touch the circumference of a circle described therefrom. And just as the human body yields a circular outline, so too a square figure may be found from it. For if we measure the distance from the soles of the feet to the top of the head, and then apply that measure to the outstretched arms, the breadth will be found to be the same as the height, as in the case of plane surfaces which are perfectly square.

Vitruvius does not intimate how he obtained his figures, whether from statuary, sculptors' rules of thumb, or by actual measurement made by himself upon a number of his more obliging friends.

Another example of the influence of the Pneumatists upon Vitruvius may be quoted from the fifth book:[15]

> A site as healthy as possible should be selected for the theater, in accordance with what has been written in the first book, on the principles of healthfulness in the sites of cities. For when plays are given, the spectators with their wives and children sit through them spellbound, and their bodies, motionless from enjoyment, have the pores open, into which blowing winds find their way. If these come from marshy districts or from other unwholesome quarters, they will introduce noxious exhalations into the system.

Later, when speaking of "Colonnades and Walks," Vitruvius confuses somewhat, in company with the best medical authorities of his day, the theories of the Pneumatic school with the more traditional humoral pathology of Hippocrates:[16]

> The space in the middle, between the colonnades and open to the sky, ought to be embellished with green things; for walking in the open air is very healthy, particularly for the eyes, since the rarefied and refined air that comes from green things, finding its way in because of physical exercise, gives a clear-cut image, and by cleaning away the gross humours from the eyes, leaves the sight keen and the image distinct. Besides, as the body gets warm with exercise in walking, this air, by sucking out the humours from the frame [sweat], diminishes their superabundance, and disperses and thus reduces that superfluity which is more than the body can bear . . . I think there is no doubt that cities should be provided with the roomiest and most ornamental walks, laid out under the free and open sky.

Aside from the theories used in explanation of the beneficial aspects of a brisk walk in the open air, this passage is interesting in that it contains one of those shrewd guesses of the ancients in the phrase, "refined air that comes from green things," which, on the basis of the oxygen and carbon cycle, is quite understandable to us. The modern point of view held by Vitruvius in regard to public health and welfare, especially in the problems concerned with crowded urban life, is well displayed in the last sentence.

Vitruvius devoted much attention to the matter of water supply and fully recognized the supreme importance of water in the economy of living things:[17]

> For it is obvious that nothing in the world is so necessary as water, seeing that all living creatures can, if deprived of grain or fruit or meat or fish, support life by using other foodstuffs, but without water no animal nor any proper food can be produced, kept in good condition, or prepared. Consequently we must take

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[15] Lib. v, Cap. 1.

[16] Lib. v, Cap. 9.

[17] Lib. VIII, Cap. iii.

care and pains in searching for springs and selecting them, keeping in view the health of mankind.

In searching for water, Vitruvius rejects all witchcraft in the effort to find a spring, pointing out that one should watch for the places from which mists arise in the morning, and dig there. He discourses on the manner in which the character of the soil influences the quality of drinking water, and gives many tests for the recognition of good water, rejecting all water in which vegetables cannot be satisfactorily cooked, and in which there is the possibility of contamination with dirt from human or animal habitations.

Of the medical properties of waters, Vitruvius speaks in a less scientific spirit probably quoting from hearsay:[18]

> Every hot spring has healing properties because it has been boiled with foreign substances, and thus acquires a new useful property. For example, sulphur springs cure pains in the sinews, by warming up and burning out the corrupt humours of the body by their heat. Aluminous springs, used in the treatment of the limbs when enfeebled by paralysis or the stroke or any such malady, introduce warmth through the open pores, counteracting the chill by the opposite effect of their heat, and thus restore the limbs to their former condition. Asphaltic springs, taken as purges, cure internal maladies. There is also a kind of cold water containing natron . . . It is taken as a purge and in passing through the bowels reduces scrofulous tumours.

This quotation affords a good example of the fruitless medical theorizing common to the period of the Roman Empire.

One of the most remarkable medical passages in Vitruvius refers to lead poisoning:[19]

> Water from clay pipes is much more wholesome than that which is conducted through lead pipes, because lead is found to be harmful for the reason that white lead is derived from it, and this is found to be hurtful to the human system. Hence, if what is produced from what is harmful, no doubt the thing itself is not wholesome. This we can exemplify in plumbers, since in them the natural colour of the body is replaced by a deep pallor. For when lead is smelted in casting, the fumes from it settle upon their members, and day after day burn out and take all the virtue of the blood from their limbs. Hence, water ought by no means to be conducted in lead pipes, if we want to have it wholesome. That the taste is better when it comes from clay pipes may be proved by everyday life, for though our tables are loaded with silver vessels, yet everybody uses earthen ware for the sake of purity of taste.

The anemic character of lead poisoning is rather clearly indicated in this extract, which must be considered as having a place with the first medical documents relating to occupational diseases.

One is tempted to quote many other passages of a nearly medical interest, as, for example, those in the second book where a lucid account, even from a modern evolutionary standpoint, is given of the origin of houses, speech and social communities, or as, in the eighth book, one is cautioned, in digging wells, to lower a candle into the shaft to see if it will continue to burn before one should venture to enter into it. It is enough, however, to emphasize the fact that throughout his work Vitruvius generally manifests a moderate and cautious display of the true scientific spirit, which in the light of his age, stamps him as a man of high intellectual achievement. If he is a fair example of the architectural genius of the Roman Empire, it is not a matter for wonder that the medical aspects of Roman architecture form the most important contributions of the Romans to the science and art of medicine.

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[18] Lib. VIII, Cap. iii.

[19] Lib. VIII, Cap. vii.

Selected Bibliography

Note: The following works were examined in the preparation of this sketch. As a real bibliography of the subject it is probably not even a fair start. If this unsatisfactory sketch and this poor bibliography can stimulate more competent scholars to publish a good "sanitary survey" of Rome and other ancient communities, it will have achieved its object.

Adams, F. The Seven Books of Paulus Aegineta. London, 1847. The three volumes of this Sydenham Society publication provide a splendid source for the therapeutic ideas of all the important Greek and Roman medical authors.

Allbutt, T. C. Greek Medicine in Rome. London, Macmillan, 1921. The best discussion.

Ashby, T. Practical engineering in ancient Rome. *Nature*, 116: 342; 576, 1925.

Bailey, C. The Legacy of Rome. Oxford, Univ. Press, 1924.

Balfour, A. Historical aspects of malaria. *Nature*, 115: 17, 1925.

Barnes, H. On Roman medicine and medical inscriptions found in Britain. *Proc. Roy. Soc. Med.*, 7: 71 (Sec. Hist. Med.), 1914.

Berry, J. A latrine of Roman imperial time. *Proc. Roy. Soc. Med.*, 17: 14 (Sec. Hist. Med.), 1921.

Besnier, M. L'Ile Tibérine dans L'Antiquité, Paris. 1902. Comprehensive and nicely illustrated monograph covering all phases of its history.

Bick, E. M. The cult of Asklepios: a critical study. Ann. Med. Hist., 9: 327, 1927.

Crawford, R. Plague and Pestilence in Literature and Art. Oxford, Univ. Press., 1914.

Celli, A. Storia della Malaria nell'agio romano Opera postuma, con illustraz. del P. Ambrogetti, e una carta topog. *Mem. d. R. Accad. naz. dei Lincei, cl. di sc. fis., med. e. natur.*, 6: 73–468, 1925. Complete history of malaria in Rome from foundation to present. The great epidemics of antiquity were during the 4th and 3d centuries b.c., and the 6th and 7th of the present era.

Cuq, E. Une statisque de locaux affectés a l'habitation dans la Rome imperiale. *Mem. de l'Acad. Inscrip., Paris*, 40: 279, 1916.

Dana, C. L. The cult of Aesculapius; his statues and his temples. *Proc. Charaka Club*, 1: 60, 1902.

Ebhardt, B. Die Zehn Bucher der Architektur des Vitruvius und ihre Herausgehen seit 1484, Berlin, n.d. Splendidly illustrated bibliography to 1915, with life of Vitruvius, analysis of his work, and survey of Roman architecture.

Elliott, J. S. Outlines of Greek and Roman Medicine. N. Y., Wood, 1914.

de Forceville, G. Note sur l'ouvrage de Charles Cameron sur les baines romains. *Bull. Soc. Franc. Hist. Med.*, 12: 18, 1913.

Friedlander, L. Roman Life and Manners under the Early Empire. 3 vols. trans. by L. A. Magnus, London, Routledge, 1913; Vol. 4, Appendices and Notes by A. B. Gough.

Garrison, F. H. History of Medicine. Ed. 4, Phila., Saunders, 1928.

Garrison, F. H. The history of drainage, irrigation, sewage-disposal and water-supply. *Bull. N. Y. Acad. Med.*, s. 2, 5: 887, 1929. An excellent and well-illustrated survey.

Herschel, C. The Two Books on the Water Supply of the City of Rome of Sextus Julius Frontinus, Water Commissioner of the City of Rome, a.d. 97, Ed. 2, N. Y., Putnam, 1913. Beautifully illustrated; contains facsimile of Montecassino mss., excellent English translation, and very extensive annotations.

Jones, W. H. S. (in collaboration with R. Ross and G. G. Ellett). Malaria, a Neglected Factor in the History of Greece and Rome. Cambridge Univ. Press, 1907.

Klebs, A. C. The history of infection. Ann. Med. Hist., 1: 158, 1917.

Krolin, F. Vitruvii de Architectura libri x. Leipzig, 1912.

Lanciani, R. The Ruins and Excavations of Ancient Rome. Boston, Houghton, 1897. An authoritative account.

Leffingwell, G. W. Social and Private Life at Rome in the Time of Plautus and Terence. Thesis in: Studies in History, Economics and Public Law. N. Y., Columbia Univ. Press, 1918.

Middleton, J. H. The Remains of Ancient Rome. 2 Vols., London, 1892.

Morgan, M. H. Vitruvius: Ten Books on Architecture. Harvard Univ. Press, 1914. A splendid English translation with notes.

Neuburger, M. History of Medicine. Vol. 1, trans. by E. Playfair, London, Oxford Univ. Press, 1910.

Prestil, P. J. Zehn Bucher über Architektur des Marcus Vitruvius Pollio. 2 Vols., Strassburg, 1913.

Rivoira, G. T. Roman Architecture and Its Principles of Construction under the Empire. Trans. by G. M. Rushforth, London, Oxford Univ. Press., 1926.

Rolleston, J. D. Lucian and medicine. *Janus*, 20: 83, 1915.

Rostovtsev, M. I. The Social and Economic History of the Roman Empire. Oxford Univ. Press, 1926.

Rouquette, P. Les ex-voto d'organes internes dans l'antiquité Romaine. *Bull. Soc. Franc. Hist. Med.*, 11: 370, 1912.

Söllner, A. Die hygienische Anschauungen des Römischen Architektur Vitruvius. *Jen. Med.-Hist. Beitr.*, 4: 64, 1913.

Southeimer, L. Vitruvius und Seine Zeit. Tubingen, 1908.

Sudhoff, K. The hygienic idea and its manifestations in world history. Ann. Med. Hist., 1: 111, 1917.

Terquem, A. La Science Romaine a l' Epoque d'Auguste: Etude Historique d'apres Vitruve. Paris, 1885.

Thorndike, L. Galen: the man and his times. *Scient. Montb.*, 14: 83, 1922.

Tomassi-Crudeli, C. The Climate of Rome and the Roman Malaria. London, 1892.

Vitruvius, M. De Architectura Libri Decem. 3 Vols., Leipzig, 1807. This is the standard text. I also used the beautiful little 1513 Florence (Giunta) edition, which includes the two books of Frontinus, and the 1586 Rome edition, annotated by Castilio.

Walsh, J. Galen. Ann. Med. Hist., 8: 176, 1926; 9: 132, 1927. Excellent accounts of Galen's life and activities in various parts of the empire.

Walton, A. Cult of Asklepios. Cornell Studies in Classical Philology, iii. Bost., 1884.

Wile, I. S. The worship of Asklepios with special reference to the tholos and the theater. Ann. Med. Hist., 8: 419, 1926.

THE MEDICAL SCHOOL OF MONTPELLIER IN THE FOURTEENTH CENTURY*

By SONOMA COOPER

BERKELEY, CALIF.

THE CITY OF MONTPELLIER

VARIOUS stories and legends are associated with the founding of the city of Montpellier, but the first fact that can be established regarding it is that it received the refugees of Maguelone when that village was destroyed by Charles Martel in 737, during his wars against the Saracens.[1] These fugitives, people of confused origins and mixed blood (ancient Greeks, Celts, Gallo-Romans, Gallo-Franks and Visigoths) greatly augmented the population of the little town growing up around a Benedictine abbey on the hill of Montpellieret. In 990 we find two villages, Montpellier and Montpellieret, situated on opposite sides of the hill. Both were feudal dependencies of Ricuin, Bishop of Maguelone, having been given to him "according to a very venerable tradition" by two pious and noble women, said to be sisters of St. Fulcran, Bishop of Lodève.

The Bishop of Maguelone kept Montpellieret and gave Montpellier in fief to the Guilhems, then unimportant feudal lords. During the eleventh century, however, these lords became powerful princes. They extended their domains and influence on both sides of the Pyrenees, built churches and endowed monasteries, founded hospitals, encouraged commerce, went on Crusades in the Orient and in Spain, and supported the Papacy against Frederick II. They also patronized learning in law and medicine and befriended the Moors and Jews seeking refuge from the growing intolerance of Spain so that many of these people settled in Montpellier.

This city, so favorably situated between Italy and Spain, was rapidly becoming one of the largest and richest commercial centers of the Midi. There Rabbi Benjamin of Tudela[2] found "Christians and Mohammedans from all parts, people of all tongues, chiefly in consequence of the traffic of the Genoese and Pisans." He also met many Jews who were "among the wisest and most esteemed of the present generation: some are very rich and benevolent toward all who apply to them for assistance." What better haven was there for learned Moorish and Jewish doctors?[3] The city offered opportunity for a lucrative practice, and at the same time tolerance in religion, freedom in scientific pursuits and contact with the best elements of western civilization. For during this period Montpellier was associated, not with France and the more barbarous north, but with Spain and Italy, centers of Greek and Arabic civilization in the west. It reflected this civilization in its ability to reconcile tolerance with faith, remaining loyal and devoted to the church during the Albigensian struggle, and profiting by the protection of popes. Under the Guilhems the city had been allowed to develop within its walls a democratic government and a spirit of independence, which privileges were confirmed in 1204 by a charter granted by the King of Aragon. In that year, Montpellier had been brought under the crown of Aragon by the marriage of the heiress of the Guilhems to Peter of Aragon. In 1262 it became a part of the new kingdom of Majorca and Roussillon, a dependency of Aragon. At this time Montpellier was a fief of the king of France, to whom the Bishop of Maguelone had given the oath of feudal submission in 1255. French kings lost no opportunity to increase their influence over this new fief.[4] In 1292, the Bishop of Maguelone ceded Montpellieret to Philip the Fair, so that when James III of Majorca sold his feudal rights over Montpellier to Philip of Valois in 1349, the two cities were reunited. In 1364, however, Montpellier was transferred to Charles the Bad of Navarre, and remained a part of that kingdom until 1383, when it came permanently under the crown of France.

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[1] This account of the city of Montpellier is based largely upon Alexandre Germain's Histoire de la Commune de Montpellier, 3 vols., new ed., Montpellier, 1871.

[2] Travels of Rabbi Benjamin of Tudela, 1160–1173. From Komroff. M., Contemporaries of Marco Polo. N. Y., 1928, pp. 254–255.

[3] That Jews were numerous in Montpellier is shown by the fact that they are mentioned especially in all decrees regulating the practice of medicine during the thirteenth and fourteenth centuries. The Guilhems had forbidden Jews to hold public offices, evidently fearing that they would gain control of the city, and in the charter of 1204 the king of Aragon repeated this prohibition. Germain, A. *Op. cit.*, 1: lxiv.

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THE SCHOOL OF MEDICINE TO 1289

Once upon a time Apollo, exiled from Asia, Africa and the rest of Europe, wandered over Gaul, seeking a favorable spot upon which to found a new medical center. Finally, attracted by a city rising from the ruins of Maguelone, Lattes and Substantion, and pleased with the surrounding country, he established upon this other Mount Pelion a sanctuary for himself and his priests. Fortune had favored the god in his choice, for, because of the location of the city, the character of its inhabitiants and its climate, no other place was better adapted to the study of letters, and especially of medicine, than this one. To the temple thus established the sons of Gaul, of Germany, of Sarmatia, of Brittany and of the two Hesperides came to honor Apollo.

Thus is the troublesome question of origins disposed of by Ranchin,[5] one of the most celebrated men of the medical faculty and its chancellor from 1612 to 1641. Later writers, not content with this explanation, advanced various other theories. The study of medicine at Montpellier derived its impetus from the Jewish and Arabian schools of Spain,[6] or from the Jewish schools of medicine at

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[4] Louis IX gave Montpellier merchants his special safeguard and the right to trade freely with the French. When he left on his last crusade, the consuls of Montpellier took an oath of allegiance to him, and he gave the city his protection.

[5] Ranchin, F. Apollinare Sacrum. This brief account is more an eulogy than a history. It is echoed by Etienne Strobelberger in his Historia Monspeliensis, a work which lacks originality to the point of seeming to be directly copied from Ranchin.

[6] Haskins, C. H. The Renaissance of the 12th Century. Cambridge, 1927, p. 388.

Rashdall, H. The Universities of Europe in the Middle Ages. Oxford, 1895, 2: pt. 1, 116. Haskins suggests this as a possibility and Rashdall mentions it to reject it as incompatible with the ecclesiastical nature of the school.

Arles and Narbonne,[7] or from Salerno[8] or it may have been a survival of the old Roman municipium.[9] As a matter of fact, all of these elements may have operated in the origins of the school. Certainly there was in the beginnings of Montpellier a strong Arabic influence, which may be accounted for by the participation of the Guilhems in the Crusades in Palestine and in Spain. But how great was this influence, and how powerful was that of Greece and Rome, cannot be determined.

The study of medicine probably began at Montpellier as soon as the city became prosperous, and schools of medicine were well established before the creation of the law school, about 1160. There are few documents pertaining to this period of "infancy"[10] of the school of medicine, but these few show that Montpellier was known throughout Europe as a medical center. In 1137, Adelbert II, later Archbishop of Mayence, had finished the arts course at Paris and had come to Montpellier to study medicine, "for here both doctrine and precepts are taught by physicians, who . . . teach hygiene to the healthy and obtain the cure of the sick."[11]

We learn from St. Bernard[12] that in 1153 the Archbishop of Lyons put himself under the care of the famous physicians of Montpellier and gave "all that which he had and that which he did not have."[13] in return for their treatment. John of Salisbury, who died Bishop of Chartres in 1180, spoke of medical teaching at Montpellier on terms of equality with that at Salerno, and described Montpellier as a place where students who were considered failures in philosophy could study and become doctors.[14]

By 1181 the teaching of medicine at Montpellier had become sufficiently important to attract the attention of Guilhem VIII, seigneur of the city, who in that year issued a declaration[15] granting to everyone, regardless of country or origin, the right to teach medicine within his domains. He promised not to give to anyone, in spite of insistence or offers of money, the monopoly of reading or teaching in the school of medicine at Montpellier, such privilege being contrary to equity and justice. He bound himself, and urged his successors, not to depart from this attitude.

This declaration was made at a very opportune time. Salerno was declining and masters were leaving that school for Paris and Montpellier. A decree had just been promulgated in Spain that all Jews and Christians must accept Islam or leave the country. Some of the Jewish doctors who had settled in Spain returned to the Levant, but many went to Languedoc. Even Mohammedan doctors began leaving the country, for the old Arabic civilization was giving way before intolerance. Naturally many of these doctors went to Montpellier, where they were free to teach the systems and theories of the schools they represented. These various doctrines had a permanent effect upon the teaching of medicine at Montpellier, as Arabic and Jewish elements were introduced, which came to be considered characteristic of the instruction given there.

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[7] Rashdall, H., *Op. cit.* 2: pt. 1, 117.

Germain, A. *Op. cit.* 1: lxx. Both of these authors accept this as a possible origin of the school.

[8] All of the aforementioned writers are agreed upon the influence exerted by Salerno upon Montpellier.

[9] Rashdall, H. *Op. cit.*, 2: pt. 1, 117.

[10] Ranchin designates the period 1000–1220 as the infancy of the school; the period 1220–1494 (from the earliest recognition by the Church to the recognition by the French crown) he called the period of puberty and adolescence; the period of maturity was, naturally enough, that in which he taught.

[11] Fournier, M. Les Statuts et Privilèges des Universités Françaises. Paris, 1890–1894, 2: No. 877.

[12] St. Bernard, writing to Cardinal Hugues, Bishop of Ostie. In: Cartulaire de l'Université de Montpellier, publié sous les auspices du Conseil général des Facultés de Montpellier. 1890–1912, 1: Intro., 11. Fournier, M. *Op. cit.*, 2: No. 878.

[13] "Cum medicis expendit et quod habebat et quod non habebat."

[14] " . . . Salernum vel ad Montempessulanum profecti facti sunt clientuli medicorum, . . . tales in momento medici eruperunt.' In: Cartulaire de l'Université de Montpellier, 1: Intro., 11 and Rashdall, H. *Op. cit.*, 2: pt. 1, 115, n.

[15] Cartulaire de l'Université de Montpellier, 1: No. 1; Fournier, M. *Op. cit.*, 2: No. 879.

So rapidly did the number of masters and teachers increase that regulation of teaching became necessary. It was not from the Guilhems that this regulation came, since that family had lost its identity in that of the royal family of Aragon. The charter granted by Peter of Aragon to the city when he became its seigneur in 1204 showed no special interest in teaching there. The power which fostered and regulated the medical school was that of the Papacy. Montpellier had for some time been associated more and more closely with the Church. The city became the headquarters for part of the Catholic forces directed against the Albigensians, and Cardinal Jean de St. Paul, legate of the Pope in the Albigensian provinces, made his residence there. From this time on, popes took a special interest in the city. In 1220, Pope Honorius III delegated Cardinal Conrad, Bishop of Porto and St. Rufino, to regulate the teaching of medicine in Montpellier. He consulted the masters and students of the faculty, and then, in concert with the Bishops of Maguelone, Agde, Lodève and Avignon, and in the name of the Holy See, he promulgated the Charter of Conrad.[16] "For many years," he said, "the profession of medical science has flourished gloriously at Montpellier, from whence it has spread over the diverse parts of the earth the abundant health and multiplicity of its fruits." It was to continue to flourish under the guidance and protection of the Church.

Henceforth no one could teach medicine publicly at Montpellier without having been previously examined and approved by the Bishop of Maguelone, who called professors of his choice to conduct the examination. The school was placed under the general charge of a chancellor in whose election the Bishop of Maguelone was to participate. The Bishop was to judge all criminal cases, and to preside over the court of appeal for civil cases which had been tried before the chancellor. If the Bishopric of Maguelone became vacant, the prior of the Church of St. Firmin[17] should act in place of the Bishop. The statutes recognized the right of association on the part of masters and students, and carefully guarded the rights of the masters against the students and against each other. They were to be read "publicly and solemnly" at the reception of each master, and to the assembled masters and students at the beginning of each term. Each master must swear to observe them strictly.[18]

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[16] Charter of Cardinal Conrad, 17 August, 1220. In: Cartulaire de l'Université de Montpellier, 1: No. 2 and Fournier, M. *Op. cit.*, 2: No. 882. This charter was confirmed by the legate of Gregory IX in 1239 (Cartulaire de l'Université de Montpellier, 1: No. 4; Fournier, M. *Op. cit.*, 2: No. 884), and by Alexander IV in 1258 (Cartulaire de l' Université de Montpellier, 1: No. 8; Fournier, M. *Op. cit.*, 2: No. 890).

[17] St. Firmin's was the parish church of Montpellier, and its prior was in daily contact with the school, since its religious fêtes and scholarly ceremonies took place there. Germain, A., L'École de Médecine à Montpellier, 1880, p. 17.

Quarrels soon arose over the interpretation of these statutes, which served the interests of the masters at the expense of the students. In 1239 these differences were submitted to the Bishop of Maguelone, whose representatives,[19] during the following year, arrived at certain decisions[20] which defined the rights of masters and students and reasserted the authority of the Bishop over the medical faculty.

There was, as yet, no university at Montpellier. The medical faculty existed side by side with a faculty of law, which taught both canon and civil law, and a faculty of art. In 1289, Nicholas IV[21] united these faculties and conferred upon them the rank of *studium generale*, thus creating the university. His bull allowed each of the three faculties to govern itself according to its established statutes. It gave to the Bishop of Maguelone the right to confer all degrees, and required all masters to give public oath to him before beginning to teach.

The period immediately following this recognition by the Pope, the end of the thirteenth and the first half of the fourteenth century, was the most brilliant in the history of the faculty of medicine at Montpellier. The country was at peace, and was prosperous. The Popes who lived at Avignon were particularly interested in the medical school, perhaps because of the doctors from Montpellier who served them. Their interest was wisely directed, and did not interfere with the freedom of teaching. French kings also showed an interest in the masters and students at Montpellier, and gave them their protection.

The Medical School (1289–1400)

Authority in the medical faculty was vested in the person of the Bishop of Maguelone, or, during his absence in his official. The presiding officer in the school of medicine was the chancellor, whose power was limited by the authority exercised by the Bishop and by the dean of the faculty. The chancellor heard all civil cases in which the masters or students of medicine were concerned, appeal in such cases being to the Bishop. The chancellor was also the guardian of the rights and privileges of masters and students under the statutes of the university, and it was he, or the vice-chancellor, who made appeals to episcopal or royal authority when such rights were violated.

Immediately after his election, the chancellor swore before the Bishop of Maguelone and the assembled masters and students that in all civil affairs he would render justice to each according to the nature of his griefs and complaints. He promised not to listen to amity nor hatred, not to yield to prayers nor silver, and to transmit intact to his successors the statutes of the university.

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[18] Lest they be lost, three copies of these statutes were to be made. One was to be kept by the Bishop of Maguelone, one by the prior of St. Firmin's, and one by the chancellor of the university.

[19] Pierre de Conques, prior of St. Firmin's and Hugues Mans, a Franciscan friar.

[20] Statuts complémentaires de l'Université de médecine de Montpellier, 14 and 24 January, 1240. In: Cartulaire de l'Université de Montpellier, 1: No. 5, and Fournier, M. *Op. cit.*, 2: No. 885.

[21] Bull of Nicholas IV, 26 October, 1289. In: Cartulaire de l'Université de Montpellier 1: No. 20 and Fournier, *Op. cit.*, 2: No. 903.

The chancellor alone could convoke the assemblies *per fidem*[22] held twice a year to determine the course of study and to conduct the necessary business of the faculty. All masters, except for the most urgent reasons, were required to attend. At these assemblies the chancellor gave an accounting of his administration to the Bishop of Maguelone, who had the right of admonition or redress.

Although the Church limited the power of the chancellor, it upheld his authority when need arose. In 1320, two masters of the faculty, Bernardus de Bonahora and Jordanus de Turre, insulted the chancellor, Guillaume de Beziers. They publicly called him a goose, and even struck him. This conduct called forth a mandate from the Pope himself,[23] who ordered the prior of St. Firmin of Montpellier and the prefect of Maguelone to judge these masters without appeal.

This pope, John XXII, took a lively interest in the medical faculty. Upon the death of Guillaume de Beziers in 1323, he appointed as his successor Bertrand Portal. He died the following year, and John conferred the chancellorship upon Jacques Gilles, although the selection of the chancellor was the privilege of the masters.

According to the earliest statutes of the medical faculty, the chancellor was elected by the Bishop of Maguelone, the oldest master, and two other masters. Later the entire faculty gained the right to participate in this election, and the candidate who received the two-thirds vote of the faculty became chancellor.[24]

John XXII was not the only pope to interfere with the right of the faculty to choose its chancellor. In 1364 the Bishop of Maguelone named Jean Jasme chancellor, although he had not received the necessary two-thirds vote of the faculty. The masters protested, and Jean de Tournemire, the rival candidate, appealed to Pope Urban V. Cardinal John of St. Marks was delegated to settle the dispute. He rescinded the election, as contrary to the rights of the masters. He then renamed Jean Jasme chancellor, at the same time protesting that he did not wish to attack the privileges of the faculty.[25] Jean Jasme was one of the most noted physicians Montpellier produced during this century. He served both Urban V and Gregory IX, and had the title, at least, of physician to Charles V of France. He was chancellor of the medical school for twenty years.

Meantime his former rival for the chancellorship, Jean de Tournemire, had become a favorite of popes. He served as physician to Gregory IX and treated Clement VII and so it is not surprising that upon the death of Jean Jasme in 1384, Clement vii named Jean de Tournemire to succeed him as chancellor.[26]

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[22] " . . . quod bis anno cancelarius per fidem faciat congregare totam universitatem dictorum magistrorum." Statutes of 1340. In: Cartulaire de l' Université de Montpellier, 1: No. 69 and Fournier, *Op. cit.*, 2: No. 947.

[23] Mandate of John XXII, 30 July, 1320. In Cartulaire de l' Université de Montpellier, 1: No. 39, and Fournier, M. *Op. cit.*, 2: No. 924.

[24] Bull of Clement V, 8 September, 1309. In: Cartulaire de l' Université de Montpellier, 1, No. 26, and Fournier, M. *Op. cit.*, 2: No. 911.

[25] Confirmation of the statutes concerning the election of the chancellor, made by Cardinal John of St. Marks, 13 October, 1364. In: Cartulaire de l' Université de Montpellier, 1: No. 123, and Fournier, M. *Op. cit.*, 2: No. 991.

The dean of the medical faculty, the oldest master in years of teaching, ranked next to the chancellor. The office of dean had been foreshadowed in the Charter of Conrad, which pointed out that precedence was due the oldest master in all scholarly ceremonies. It also provided that the oldest of the masters should determine the vacations and that the other masters should regulate their work accordingly. The senior master must not allow personal infirmity nor a desire for repose to influence him in setting the holidays. This office was definitely recognized by Cardinal John of St. Marks, acting for Pope Urban v in 1364.

The chancellor and dean were assisted in the administration of the school by a beadle, who reported to them daily. He was elected by the faculty of the school. This officer saw to it that the calendar of the school was carried out as planned by the dean. He purchased books and sold or rented them to the students, but he did not have a monopoly on the sale of books. He collected twelve denarii a year from each student and two solidi from each bachelor. The candidates for degrees notified the beadle when they were ready for their examinations, and he arranged with the masters the time and place for such examinations. The new master made gifts to the beadle, as he did to his master. The beadle played an important part in the ceremonies, and was placed next to the chancellor and dean in processions of the school. As a sign of his rank and dignity, he carried a silver wand.

Precedence by seniority was scrupulously observed by the faculty. By seniority masters were seated in all ceremonies of the school, and by the same order they participated in the examinations of candidates for degrees. In processions of the school, masters always came first. When notable strangers were guests of the faculty, they were placed next to the masters, and spoke after them if they wished to join in the debates or examinations of candidates.

Three proctors had charge of the material interests of the school, two representing the masters, and one representing the students. The latter was chosen from among the bachelors one year, and from among the students the next. Their chief duties were to guard the goods of the school, and to protect the interests of the groups they represented. The student-proctor came to be an important officer.[27] He held one of the keys of the chest in which the property of the school was kept. The two other keys were held by the chancellor and the junior master. The proctors were allowed to keep a sum of fifty or sixty solidi outside of this chest for the immediate needs of the university. The proctors had to give regular accountings of the receipts and expenditures of the school. This accounting was made in full assembly, or at least before the chancellor, dean and students.

It was necessary to hold assemblies

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[26] Pansier. Les maîtres de la faculté de médecine de Montpellier au moyen age. *Janus*, 10: 2, 1905.

[27] In the next two centuries the student-proctor gained a great deal of power, obtaining the right to warn masters who were lax in giving their courses, and taking charge of the introduction of new students. This office was suppressed in 1550. Cartulaire de l'Université de Montpellier, 1: 68–69.

of the entire school at least twice a year. These two assemblies *per fidem* could be called only by the chancellor. One was held sometime between St. Michael's Day and St. Luke's Day; the other in the week after Easter. The university bell summoned the masters to St. Firmin's Church, where assemblies were held. All masters were required to attend these two meetings of the school. The first of these assemblies was the most important, as then the courses for the ensuing year were agreed upon, the proctors were chosen, and the keys to the archives[28] and coffers were distributed.

Other assemblies were held from time to time, all masters having the right to hold them. At these assemblies questions concerning the discipline and interests of the school were considered and voted upon by masters and students.

The protest of the students against the powers of the masters had led to the definition of students' rights in the statutes of 1240. Thereafter each master was required to present a book of practice as well as a book of theory in his course. The bachelors were allowed to go to the schools of all the masters and mingle in the disputes there; and the privileges of students who were being presented for degrees were clearly defined. The demand for well-defined rights and practical instruction is readily understood when we realize that the students were adults, many of them having finished masters of arts courses at other universities. The democratic government and the spirit of freedom which prevailed in the city of Montpellier were probably also contributing factors. Then, too, many of the students were ecclesiastics, enjoying church benefices, and were men of rank and dignity. The earliest statutes show that ecclesiastics studied and taught at Montpellier. The Charter of Conrad provided that all masters or students who enjoyed ecclesiastical benefices or were in sacred orders should wear the tonsure, and that all regulars should wear the monastic habit of their orders. Some of the most famous men of the medical school were churchmen as well as doctors. In the thirteenth century Jean de St. Gilles, a Dominican friar and student of theology, taught medicine at Montpellier and at Paris. He left writings on both theology and medicine. Jean d'Alais and Guillaume de Brescia were at the same time chaplains and doctors of Clement v.[29] Pierre d'Espagne, who studied and taught medicine at Paris and at Montpellier, became Pope John xxi, in 1276.

These illustrations suffice to show that the prohibitions of the popes against the study of medicine by churchmen were not seriously regarded, even by popes themselves. These prohibitions may have been issued to keep clergy as a class from becoming too engrossed in outside interests, rather than to discourage the study of medicine, for there is nothing in the history of the medical school at Montpellier to show that the popes interfered with the freedom of teaching or the doctrines that were taught there. Clement v prescribed the course of study followed at Montpellier during the fourteenth century, but did so on the advice of his Montpellier physicians, and to aid, not hinder, teaching there.

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[28] The archives of the school were kept in the Chapel of the Three Kings in the Church of St. Matthew. They were not carefully kept, however, and many documents have been lost.

[29] It was upon the advice of these doctors, and that of Arnauld de Villeneuve, that Clement v drew up the course of study to be followed in the medical faculty. Bull of Clement v, 8 September, 1309. In: Cartulaire de l'Université de Montpellier, 1: No. 75 and Fournier, M. *Op. cit.*, 2: No. 910.

The medical students seem to have been less given to gaiety and quarrels than those of the school of law at Montpellier, and medieval students in general. They did, however, elect each year a king of festivals, whom they paraded through the streets of the city with great show. The university finally opposed the election of a king, and so they elected an abbé instead. He served the same purpose as the king; he presided over their banquets, of which they had many. Finally the abbé also was suppressed, but the banquets survived, till a statute of 1527 reduced their number to two a year.

Group consciousness on the part of students, and masters also, had been encouraged by episcopal authority from the beginning of the school. The Charter of Conrad gave them the right of association, and urged them to assist any of their number injured by an outsider. There is little evidence that the students exercised this right of association, except when they wished to protest against their masters.

Students were made to register the date of their entrance into the university and the date of their departure. In this way they could prove that their residence requirements had been fulfilled when they were eligible for degrees. For this privilege of registering the student paid two denarii at the beginning and four denarii at the end of each year. Within eight days after matriculation new students were required to give an oath to uphold the statutes of the university. They also swore to serve the university and to uphold its honor and good name; to be faithful and obedient to the university; and not to practice medicine in Montpellier nor in its suburbs. This oath was sworn before the chancellor of the university or upon the altar of the Chapel of the Three Kings in St. Matthew's Church. The bachelor, the licentiate and the newly created master of medicine had to give oaths, all very much like the first one given.

Before Montpellier came under the authority of the crown of France its kings extended their protection to masters and students there. Charles IV took the masters and students under his protection in 1327. Four years later Philip VI issued a decree providing that his officers in Montpellier were to maintain and defend the rights, liberties and possessions of the masters and the students in the medical school. The students at Montpellier were taken under the special protection of Louis, Duke of Anjou, lieutenant of Charles V in Languedoc by letters patent issued by him in 1365. He ordered that neither they nor their companions should be disturbed with regard to taxes, finances or exactions for their wines, food, wood and other necessary provisions. The same official exempted both masters and students from taxes on their living. Charles VI went even further than his predecessors in this regard. He deputized twelve royal sergeants to protect the rights of masters and students at Montpellier.

The protection of the rights of the masters of the medical faculty had been the chief concern of Cardinal Conrad in granting the earliest statutes to the medical school. He declared that no student who had difficulty with a master regarding salaries or any other question should be received by another master till he had given or promised satisfaction to the first master. Conrad also forbade masters to attract to their classes the students of their colleagues. Later statutes defined the rights of the students and placed some restrictions upon the masters. Each master, before beginning to teach in the schools, had to swear to assist the chancellor at the assemblies *per fidem*, to observe the statutes of the university, not to teach outside of the university nor in the schools of other masters, to give his services to the Pope, King, or other eminent person,[30] and to teach according to the regulations of the university.

There was a restriction dating from 1313 that to teach in the school of medicine masters must have been born of legitimate marriage or have a special dispensation to teach. Masters not only submitted to this ruling, but even made use of it to try to rid the university of a colleague. Pons de Lunel had practiced medicine at Avignon and in 1313, armed with a special dispensation since he was not born of a legitimate marriage, came to Montpellier and demanded the right to teach and practice there. The masters, represented by their proctors, protested to Bernard Gordon, then dean, that he should not assign a course to Pons de Lunel, since he was illegitimate, unworthy and incapable. Bernard Gordon allowed him to read in the school, however, and obtained the support of episcopal authority when the masters criticized him. The masters even questioned Bernard Gordon's right to act in the matter, since he was not reading in the school at the time. In 1330 John xxii authorized Pons de Lunel to teach and practice at Montpellier. Then began a series of futile protests and appeals from the masters to the Papacy which lasted till 1338. They even resorted to a lawsuit for the "conservation of their privileges" with no more satisfaction than they had received from the Pope.

The masters were always quick to defend their rights and privileges against ecclesiastical encroachment. In 1289, the Bishop of Maguelone conferred the license to teach upon Armengaud Blaise, who had been examined and rejected by the masters as not capable of teaching. The official of the Bishop forced the masters, some by threats of excommunication, and some by imprisonment, to consent to grant the degree. Whereupon the faculty appealed to the Pope to defend its rights. The Pope ordered an inquiry into the matter, but the result is not clear.[31] In 1309, Clement v definitely established the rights of the masters in granting degrees, by requiring a candidate to receive the approval of two-thirds of the masters before he could receive the license to teach.

This same pope, acting at the request of his Montpellier physicians, outlined the course of study to be followed in the medical faculty at Montpellier. Upon this course was based the one which was dedicated in full assembly of the masters in 1340. It fell into ten groups of subjects of courses, as follows[32]

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[30] Masters absent from the university for such a purpose retained their status in the school if they chose to do so. Such a service was held to reflect creditably upon the school. (Statues of 1340.)

[31] Armengaud Blaise is accepted as a physician of Montpellier, not as a member of the medical faculty, by Germain, and his view is accepted by Ernest Renan, Armengaud, Fils de Blaise, in: *Hist. Litt., de la France*, 28: 129–130, and by Pansier, Les maitres de la faculté de medecine de Montpellier au moyenâge, *Janus*, 9: 503, 1904.

1. Avicenna.
    First book of his Canon.
2. Galen.
    De morbo et accidente, and
    De differentiis febrium.
3. Galen.
    De crisi et criticis diebus, and
    De malicia complexionis diverse
4. Galen.
    De simplicibus medicinis, and
    De complexionibus.
5. Hippocrates.
    Liber aphorismi, and
    Regimine acutorum, or
    Prognosticis
6. Galen.
    De juvamentis membrorum, and
    De interioribus.
7. Galen.
    De ingenio sanitatis, and
    De arte curativa ad Clauconem.
8. Avicenna.
    Fourth book of his Canon, the first two sections, with
    Johannicus. De pulsibus, or
    Theophilus. De urinis.
9. Galen.
    Tegni, with
    Hippocrates.
    Prognosticis and Regimine acutorum.
10. Galen.
    De regimine sanitatis and
    De virtutibus naturalibus.

If this course was not sufficient for all the masters wishing to read in the school, other courses were chosen from the books they wished to read, such as the "De febribus" of Isaac or his "De dietis universalibus," or the third or fourth book of the "Canon" of Avicenna, or some of the other books of Galen, or the works of Rhazes, or those of Constantine Africanus.

In the ten regular courses the emphasis was upon Greek medicine, with the study of Galen predominating. The texts[33] used were Latin translations from the Arabic versions of Greek writings, with commentaries by Arabian doctors. The Arabian doctors who translated the Greek medical writings also analyzed and classified them, and added to them their knowledge of diseases and of the use of new drugs. Thus Arabian medical ideas became an integral part of European medicine, although the books of Greek authors were studied more widely than those of Arabian doctors. Galen, with his belief in humors and in the importance of theory and of universal systems, was the principal authority. Medical teaching consisted chiefly in reading the books prescribed by the course, and the commentaries upon those books, for in medicine as in other subjects, the scholastic method prevailed, and reliance upon authority was the rule, rather than observation and independent thinking.

Each master designated, in the assembly *per fidem* at the beginning of the year, the course he would give that year, and, once having selected the book he would read, he could not change it. First the oldest master designated the book he would read, then the youngest master chose his book for the year, and then the other masters named the courses they would give, alternating in the same way. A master could not repeat instruction on a book until the sixth year, as he had to cover the whole field of medicine in five years. This prevented specialization, and so retarded the development of medical science, but it assured the student of a complete course. For when a student chose his master, he studied with him throughout his career, and was presented by him for his degrees.

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[32] Germain, A. La médecine Arabe et la Médecine Grecque à Montpellier. Montpellier, 1879, pp. 7–8.

[33] Often these books were difficult to procure, and because of this fact the regulations of 1240 provided that any master or student who owned an authentic book of medicine which others did not have or could not buy, must lend it to them. The borrower had to give a pledge to the owner for the book, however, and had to return it in good condition.

The medical school conferred three degrees, those of bachelor, licentiate and master. Master in medicine corresponded to doctor in law, but the term doctor in medicine was not used at this time. Six years were required to become a master in medicine at Montpellier, or five years if the candidate held the degree of master of arts from Paris, or from one of the other large universities. To this period of academic work were added six months of practical experience.

When the candidate for degrees had completed three years of study, he could present himself for examination to become a bachelor. This was a public examination lasting four hours. The successful candidate swore that he would attend lectures faithfully for three years; that he would not practice medicine in Montpellier nor in its suburbs[34] until he had become a master, nor would he allow others to do so without revealing it to the proctors, and that he would serve the honor and interests of the university and its masters at all times.

When a bachelor had completed the required three years of study and six months of practice, he was presented by his master for the examinations for the licentiate. First came four examinations *per intentionem*, so called because the bachelor took them with the intention of becoming a candidate for the license. These examinations covered a period of eight days. Each day the bachelor sustained a thesis which had been assigned to him the evening before. He had to speak at least an hour on each thesis. Eight days after these examinations he submitted to the *examen rigorosum*, in which he had to sustain two more theses, one on a malady of some sort and one on an aphorism of Hippocrates, drawn twenty-four hours before his examination. He discussed each thesis from noon till four o'clock, and answered all questions put to him by the masters. These examinations were presided over by the chancellor, dean, or bishop. The successful candidate received the license from the Bishop of Maguelone eight days after the examinations.[35] Two members of the faculty accompanied him to the home of the Bishop upon this occasion. The degree of licentiate meant little in itself, being merely a step toward the mastership.

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[34] There were many hospitals in Montpellier in the fourteenth century and they would seem to be the logical place for bachelors to obtain their practical experience. However, the faculty forbade them to practice in the city. It may have been that the masters feared that inexperienced bachelors would compromise the medical reputation of the city and of the school, or it may have been that there was not enough practice for bachelors in a city where there were so many doctors. Because of this prohibition, the medical students amused themselves by driving the new bachelor from the city with a great show of violence, crying to him: "Vade, et occide Cain."

[35] Before the license was conferred, the candidate had to swear that he had fulfilled all the requirements for the license; that he had been born of a legitimate marriage; that he would take his master's degree at Montpellier; that he would obey the statutes

There were three more examinations to be passed before the candidate became a master. These took place during three days, when the licentiate was examined for an hour each morning and evening. The conferring of the master's degree was called the *actus triumphalis*, as well it might be after the long series of tests given the student.

This ceremony was held in St. Firmin's Church, in the presence of the masters, students and citizens, who were summoned by the ringing of the university bell. The successful candidate, with the master who sponsored him, was conducted to the church with music. The beadle went before them, clad in the robe given him by the new master.[36] When they arrived at the church, the new master swore before the altar that he would honor and serve the university and its masters, and that he would obey its statutes. The new master addressed the assembly upon a question which the chancellor had assigned to him the previous night. Then he was given the insignia of a master in medicine: a black cloth bonnet surmounted by a tuft of crimson silk, a gold ring, and a gold sash which was symbolic of the books of Hippocrates. The chancellor then seated the new master beside himself, and gave him his benediction. When the ceremony was over, the new master greeted his friends and thanked his masters.

The new master had to swear once more to obey the statutes of the university and not to reveal its secrets. He also swore not to treat anyone ill with an acute disease without calling a priest if it were possible for him to do so, and not to treat any leper at Montpellier for more than eight days.[37] He promised not to give more than five sous to an innkeeper for a cure.[38] He swore to avert or to reveal any peril to the university if he knew of it. He also swore to attend the assemblies *per fidem* unless he had a legitimate reason for absence. After this he was qualified to begin teaching. He was required to read as a master for two years at Montpellier before reading elsewhere. The day upon which a new master began to read was a holiday, and all masters went to hear him read, and took part in the discussion. After the new master had completed his reading, masters and bachelors were his guests at a luncheon.

The ecclesiastical authority which so carefully regulated medical teaching ignored the practice and teaching of surgery, which went on side by side with that of medicine at Mont-

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of the university; and that he would not practice in the city until he had obtained his master's degree. (Statute of 1383.)

[36] The new master gave the master who sponsored him a new robe, tunic, gloves, and such gifts to the value of twenty-five silver Turonenses. He was not supposed to make gifts to the other masters. He gave similar gifts to the value of twelve silver Turonenses to the beadle.

[37] Statutes of 1240. The Statutes of 1340 provided that no leper, or suspect, should be given a letter testifying that he was cured of, or not infected with leprosy except upon the agreement of two doctors, who should both sign the letter.

[38] Many people who were ill came to Montpellier because of its climate and the reputation of its physicians. It would seem that hotel keepers collected a commission on the fees paid to physicians by their patients who were guests in the hotels.

pellier. Guy of Sora, in confirming the earliest statutes regulating medical teaching at Montpellier, deliberately excluded the surgeons from the necessity of following the regulations laid down in the statutes. The fact that he mentioned surgery shows that its teaching and practice was recognized as distinct from that of medicine at Montpellier. Surgeons were not required to give proofs to the Bishop of Maguelone before they could practice, as were the doctors. Surgery was not recognized by the Church, and churchmen were forbidden to practice it. Nevertheless, during centuries marked by so many wars, surgery was a necessary science and attained a remarkable development. But, having grown up outside of ecclesiastical regulation, it refused to be bound by it.

At Montpellier, where the authority of the Pope and the Bishop of Maguelone was so great, nothing was done to prevent the practice of surgery, even by masters who were members of the faculty of medicine. It was probably taught outside of the faculty as medicine had been before the statutes of Conrad regulated it. But the early history of surgery at Montpellier must be largely speculative and incomplete because of the lack of documents on the subject. The barbers of Montpellier organized as early as 1252, but in addition to these, there were doctor-surgeons who taught and studied medicine under the university regulations, and at the same time taught and studied surgery without restrictions. The teaching of surgery at Montpellier in the fourteenth century may be judged from the writings of the men who taught and studied it there.

In 1304, Henri de Mondeville was teaching surgery at Montpellier, after having studied medicine and surgery there and at Paris. He had become surgeon to Philip IV in 1301, and accompanied the king on his campaigns. Service with the French armies and his private practice gave him a wide and practical experience, the results of which are evident in his "Chirurgia."

Henri de Mondeville considered surgery a nobler and more lucrative profession than medicine. A surgeon, according to him, should have a thorough knowledge of medicine and anatomy, in addition to careful training in surgery under the best masters. He should be bold, yet cautious in dangerous operations. He also should be "highly moral, should care for the poor for God's sake and see that he makes himself well paid by the rich."[39] He emphasized the importance of good nursing in the recovery of patients. He believed that a cheerful state of mind on the part of the patient, and the confidence of a patient in his doctor were important factors in effecting a cure.

He was familiar with the writings of all the authorities on medicine and surgery and quoted them frequently in his "Chirurgia," but did not accept all their doctrines. He was a practical surgeon, and made improvements in needles and thread holders, invented an instrument to extract arrows, and removed pieces of iron from flesh by means of a magnet. He did not use salves for wounds, but washed them clean and left them to heal.

Gui de Chauliac, "the ablest practitioner and most cultured surgeon of his age,"[40] studied at Montpellier under Raymonde de Molière. He took his degrees at Montpellier, and later studied at Bologna and Paris. He became physician to Clement VI. Gui de Chauliac had so complete a knowledge of surgery that his "Grande Chirurgie" was used in the study of surgery at Montpellier in the sixteenth century, when the students referred to it as the "Guidon." It was, he admitted, a compilation of the works of Greek, Arabian and Roman doctors, with the addition of his own ideas, "for we are like children on the neck of a giant, who see all the giant sees, and something besides." He did see much else besides, more than any of his contemporaries. He saw that a good surgeon needed a knowledge of medicine and anatomy. He described the methods he used in operating, and the instruments he employed. He removed cancer, treated fractures and dislocations much as they are treated today, did successful trepanning, and even removed part of a man's brain in an operation. He used narcotics in operations.

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[39] The account of the work of Henri de Mondeville given here is based largely upon Walsh, J. J. Old Time Makers of Medicine. N. Y., 1911, pp. 264–276.

Aside from his knowledge of surgery, the writings of Gui de Chauliac reflected sound ethics. He believed that a surgeon should be expert, ingenious and of good morals. He also should have courage when he knew what should be done, but should exercise caution when there was danger; he should "avoid evil cures and practices," be kind to the sick and helpful to his colleagues. He should not demand exorbitant fees.

Surgery had reached this practical and ethical height at Montpellier without the regulation or encouragement of episcopal authority. When Montpellier became the property of France, French kings interested themselves in the university, and it is from them that we have the first official recognition of surgery there. In 1376, Louis, Duke of Anjou, lieutenant-general of Charles V in Languedoc, issued a decree allowing one body of a criminal to be given each year to the faculty of medicine at Montpellier for dissection. He based this sanction of dissection upon social and scientific interests.

There had been dissections at the school of medicine before this time. The Statutes of 1340 had provided for a dissection to be made once in two years. From 1376 on, however, they could be held with regularity and with royal sanction. Montpellier seems to have been the only school in France to enjoy such a privilege at this date.

Evidently the royal judges did not deliver the bodies to the medical faculty, for in 1377 we find Charles the Bad of Navarre, at the request of François Cunil, his doctor, and a member of the medical faculty, repeating the order to the officials of Montpellier that they deliver the body of one condemned to death to the medical faculty for the study of anatomy.

In 1396, Charles VI found it necessary to reiterate this sanction, and the chancellor of the medical faculty presented the demand to the bailiff of Montpellier. Three times, at least, in the next century, this demand was repeated.

The first regulation of the practice of surgery at Montpellier was made by Charles VI in 1399, when he forbade the practice of surgery to anyone, Christian or Jew who had not proved himself qualified before a group of masters assembled to examine him. Those meeting with the approval of these masters were given the right to practice surgery by the consuls of Montpellier.[41]

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[40] Withington, E. T. Medical History from the Earliest Times. London, 1894, p. 217.

The letters of Charles VI already referred to also forbade the practice of the apothecary's art without regular examination. Pharmacy had been studied as a part of medicine in the faculty at Montpellier, even by churchmen in the general chapter of Dominicans there, for the Papacy had no reason to discourage its study. In fact, doctors had to know about the preparation of medicines, for those practicing in small villages did not have access to apothecary shops. The Greek and Arabian medical treatises of the time contain many formulae for medicines, some of them quite complicated and employing oriental ingredients. These were necessarily simplified by European physicians.

Naturally apothecary laboratories and shops abounded in Montpeller, and as early as 1340 the university had recognized the need for regulating the sale of medicines. The statutes of that year provided for the granting of licenses to apothecaries by the Bishop of Maguelone, with the consent of two-thirds of the masters of the university. The apothecaries who did not have such licenses were forbidden to sell laxative medicines to any one in the city without consulting one of the masters of the university. Each year two doctors were elected from among the oldest masters, and it was their duty to warn the apothecaries to abide by these regulations.

Besides the apothecaries, we find in Montpellier certain *épiciers* or makers of electuaries. These, also, the university undertook to regulate and two masters were officially charged with their surveillance. These masters compelled the *épiciers* to obey the oath required of them that they make their electuaries faithfully, without adulteration, and according to written formulae. Ointments, syrups and powders of various sorts were made by the *épiciers* also.

In 1364, royal sanction was given these regulations by Louis, Duke of Anjou, who forbade the apothecaries to ignore them; and Charles VI forbade the practice of medicine, surgery and the apothecary's art in Montpellier to anyone who had not proved that he was qualified.

The Medical School of Montpellier and The Black Death

In the middle of the fourteenth century there swept over all Europe the great epidemic commonly known as the "black death." This plague had existed in parts of Asia for at least three thousand years, but only the severe epidemics are noted by historians. Of these there had been many in Asia prior to 1348, and Europe and suffered from them in the sixth and again in the eleventh century, just before the Crusades. Quiescent for two centuries, the plague gradually increased until the fourteenth, when an epidemic broke out and spread over Asia and Europe resulting in greater loss of life than has ever been known from one cause.

Unsettled conditions in Asia at this time make it impossible to determine its origin. It broke out in

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[41] It was not until the end of the sixteenth century that a chair of anatomy was established in the faculty of medicine. Henry IV established the first royal chair for the teaching of anatomy.

Constantinople in 1347, coming from the shores of the Black Sea, and is supposed to have been carried to Europe by one of three Genoese ships which docked at Marseilles after having been driven from Genoa.[42] From Italy and southern France, it spread over Europe, where conditions were favorable for an epidemic.

In the preceding years there had been heavy rains and floods followed by failure of crops in many parts of the country. Italy had suffered from earthquakes, also. Plagues of insects and mice increased the discomfort in some localities. Then, too, all of Europe was at war, and the bad conditions under which armies fought rendered the soldiers susceptible to disease. During periods of truce, the soldiers became brigands and caused untold suffering among the peasantry. Townspeople were crowded within the walls of cities, where streets were unpaved and filthy, and where pigs were the only scavengers. The dead were buried in churchyards within the cities and villages. Open wells usually supplied the cities with water. People lived in poorly constructed houses and wore heavy and unhygienic clothing. Many of them lived in an unbelievable state of squalor, immorality and filth. All of these conditions favored the spread of disease, and so caused epidemics. It was among the poorer classes of people who would be most quickly affected by natural disasters, and among those who lived in filthy conditions, that the mortality of the epidemic of 1348 was the greatest.

While the worst epidemic of the fourteenth century was in 1348, Europe suffered repeated outbreaks of the pestilence, which reappeared in southern France in 1360, 1372, and in 1382.[43] Our interest in the plague centers in Avignon, where Montpellier physicians attended the popes, and in the city of Montpellier.

Gui de Chauliac, who was physician to Clement VI and witnessed the plague at Avignon, wrote a treatise on the plague.[44] According to his account the pestilence commenced in January, 1348, and lasted for seven months. In the three days following the fourth Sunday in Lent, the death-rate was four hundred a day. Seven cardinals died at this time. Almost three-fourths of the population perished. Gui de Chauliac wrote that "people died without attendants and were buried without priests. The father did not visit the son, nor the son his father. Charity was dead, and hope abandoned."

Another interesting account of the plague at Avignon was written by a "Canon of the Low Countries" to his friends in Bruges.[45] This canon was at the court of Clement VI when the plague reached Avignon. He distinguished between the pneumonic and bubonic types of the plague, and said that both types were fatal.

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[42] For general information on the plague, the following accounts have been used: Hecker, J. F. C. Die grossen Volkskrankheiten des Mittelalters, trans. by Babington, B. G. The Epidemics of the Middle Ages. Berlin, 1859; Gasquet, F. A. The Great Pestilence. London, 1893; Nohl, J. Der schwarze Tod; eine Chronik der Pest 1348 bis 1720, unter Benutzung zeitgenössischer Quellen bearb., trans. by Clarke, C. H. The Black Death, London, 1926.

[43] The epidemics of 1360 and 1372 were mainly of the bubonic, not the pneumonic type, and many people recovered from the plague during those two epidemics. It is characteristic of the plague that the mortality is greater in the pneumonic type than in the bubonic type.

[44] de Chauliac, G. Grande Chirurgie. Tract. II, Doctrin ii, cap. 5. Ed. by E. Nicaise, Paris, 1890.

[45] Brevi chronicon clerici anonymi, quoted in Gasquet, The Great Pestilence, pp. 39-42.

> The sickness has already grown to such proportions that, from fear of contagion, no doctor will visit a sick man, even if the invalid would gladly give him everything he possessed . . . Neither relatives nor friends go to the sick, nor do priests even hear their confessions nor give them the Sacraments; but everyone whilst still in health looks after himself. . . . All the poor who were wont to receive bread from the rich are dead.

This canon wrote that half of the population of Avignon had died. During the first three months of 1348, 62,000 bodies were buried in Avignon,[46] many of them in a field which the Pope bought and consecrated as a cemetery. In March of that year, Clement VI gave plenary absolution till Easter to all those who, "having confessed and being contrite," died of the plague. He ordered processions of the faithful, and took part in these himself. People came from the neighboring villages to participate in these ceremonies and this spread the disease. The idea that the disease had been spread deliberately by poisoning the water became prevalent, and many men were killed by the people because they were believed guilty of poisoning the wells. Jews especially were accused of this crime, and many innocent people were killed as a result.

The anonymous canon advised the friends to whom he wrote to eat lightly and to avoid fish, to drink temperately, to keep their bodies warm, not to commit excess of any kind, and above all to remain at home until the epidemic had passed, and to avoid contact with other people.

In this epidemic Montpellier lost over nine-tenths of her population. The city was deserted and most of the houses were closed. Of the twelve consuls, ten died. Consuls and citizens protested that they could not pay their taxes because of the mortality. In the monasteries, also, the death rate was high. In the chapter of Dominican friars, numbering about a hundred and forty, all but seven died.

Simon de Covino, a Paris doctor who was practicing medicine and astronomy at Montpellier at this time, has left us a vivid description of the plague in his poem "The judgment of the Sun at the feast of Saturn."[47] He described the bubonic type of the plague, and noted that those affected with it soon died. He described also the pallor of the faces of plague victims; "the sentence of future death could be read in the faces of men and women."

> It remained for the entire year. In whatever territory it prevailed came grievous death which endured for all seasons . . . It took everyone; people of all ages, babies and pious mothers, little children and old people, adolescents, young girls and beautiful women . . . strong and weak, thin and fat, people of all colors; the servant perished with the master, the rich man with the poor. . . .
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> Son fled from father, brother failed brother, a friend did not know his friends . . . nor were tears shed for departed friends. Men waited for booty; they robbed; and his riches were snatched

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[46] Laura de Noves, to whom Petrarch addressed his sonnets, was among the victims of this epidemic at Avignon. She died on Good Friday, March 27, 1843.

[47] de Covino, S. Libellus de judicio Solis in conviviis Saturni. In: Opuscule relatif à la peste de 1348, composé par un contemporain. In: Bibliothèque de l' école de Chartes, S. 1, 2: 201–243.

away before the eyes of the sick man were closed . . . There was no celebration of obsequies, no reverence, no funeral . . . In many cases bodies were crowded into great four horse carts and placed in a ditch, more than a thousand together, and scarcely covered with earth . . . A thousand homes stood empty and the doors were closed. Some even hung open on their hinges. Within them the foul vapor and dark silence terrified timid souls. Upon the death of the master the house remained solitary, and green grass covered the closed portal. Often the heir was gone, and sometimes the next heir. An unexpected chance for succession arose. The poor man became master of the earth, which was no longer of much value, for dear things are now of little value, and the contrary also is true. Accustomed order reverted through changing fortunes and griefs. The madness of the human race was not changed. Avarice and a mad greed for wealth increased. As the crowd gained more, so much the more it rushed into a sea of vices, and so much the more it merited the blows and the unhappy fears which it suffered . . . We must shudder and grieve at this impious crime rather than at lost bodies. So horrible was it that I have not been able to describe adequately this infamous thing, nor could a future generation believe.

In 1361 there were frequent recurrences of the plague, and it was so bad for three months that in many places half of the people died. At Avignon 17,000 persons died between March and July, of whom one hundred were bishops and five were cardinals. At Montpellier five hundred people died in one day. In the first epidemic the mortality had been greatest among the poor and in the crowded sections of the cities; now "the rich, nobles, children and few women" perished.

Again in 1382 the epidemic appeared. This time the young people especially seemed to be affected by it. The consuls of Montpellier sought the special intervention of God for their city by measuring its walls with a thread and with this thread for the wick, making a candle which was burned upon the altar of Notre Dame.

Such a series of epidemics was a challenge to the medical profession of the century. The doctors of the medical school of Montpellier met the situation courageously, and many of them died, victims of the plague.

The doctors had armed Lachesis with remedies for fighting her sister[48] but that armor was of little value to her, and so she fled, and her people with their doctors fell, overcome. It happened truly at Montpellier, where there was a greater number of doctors than elsewhere, that most of them succumbed. It is true, nevertheless, that to some these remedies of the doctors were of value, and they were able to resist death by medical knowledge.

A wealth of literary and historical material concerning the pestilence is available. Many medical men of the century, among them several doctors who studied or taught at Montpellier, wrote treatises on the plague. Gui de Chauliac's treatise on the plague has been noted. Jean Jasme, likewise a papal physician, whom Clement VI made chancellor of the medical school at Montpellier in 1364, wrote his "Tractatus pestilentia"[49] in 1376. Raymond Chalmel de Viviers,[50] also among the physicians of the papal court at Avignon, wrote what is considered to be one of the best treatises on the plague.[51] A document[52] commonly attributed to a Montpellier doctor is that of an anonymous physician who was practicing at Montpellier in 1348. Treatises written by doctors not of Montpellier origin are the "Compendium de epydimia,[53] drawn up by the medical faculty of Paris at the request of Philip VI; the treatise of John of Burgundy,[54] a doctor of Liège; and that of Pietro de Tossignano,[55] who taught and studied medicine at Padua and Bologna. These treatises will give an idea of medical opinion concerning the plague outside of Montpellier.

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[48] de Covino, S. *Op. cit.* In this poem, Atropos signified the corruption and death being visited upon mankind by the gods. Lachesis tried to defend the human race against her sister. She donned a suit of armor and took up weapons "made by the hands of man." The remedies used to prevent or cure the plague formed this defense of Lachesis. Thus "wine, delicately mellowed with spices, and food which was easily digested made the helmet" of Lachesis; such ingredients as earth adorned with figures (seals), garlic, curds and vinegar, and theriaca were used to make her shield; "ash wood and grape vine with rosemary and young oak, all of which had been hardened by fire and combined with sharp iron" were used for her lance; while alöes, storax, amber mixed with mastic and camphor and costus made her strong sword.

There are many points upon which these doctors agree. One is that the universal cause of the plague was a conjunction of Mars, Jupiter and Saturn which occurred on March 24, 1345.[56] They assigned various specific causes for it also.

Gui de Chauliac pointed out that the physical condition of the body was a particular factor in the development of the disease, hence the great mortality among the populace, laboring classes and those who did not live properly. He distinguished between two types of the plague, the pneumonic type which prevailed during the first two months of the

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[49] Sudhoff, K. Pestschriften aus den ersten 150 Jahren nach der Epidemie des "schwarzen Todes," 1348. *Arch. f. Ges. d. Med.*, 17: 23–29, 1909–16. The treatise of Johannes Jacobi (Jean Jasme) is analyzed in Singer. D. W. Some plague tractates (Fourteenth and Fifteenth Centuries). *Proc. Roy Soc. Med.*, 9: pt. 2, 159–212, 1915–16. This treatise is reprinted, as it was published about 1476 under the title, Le regime de l'epidimie et remedde contre icelle, in Klebs, A. C. et. Droz, E. Remedes contre la Peste, Fac-similés. Notes et liste Bibliographique des Incunables sur la Peste, Paris, 1925, pp. 7–32. In the same work is reproduced the treatise, Remède tresutile contre fièvre pestilencieuse, which was published as the work of Bishop Canute of Vësteras, although it was a copy of the treatise by Jean Jasme. The treatise of Jean Jasme was often copied during the fifteenth and sixteenth centuries.

[50] Commonly and erroneously called Raymond Chalin de Vinario.

[51] In Sudhoff, K. *Op. cit.*, pp. 35–39.

[52] Consultation d' un practicien de Montpellier, 1349. In: Michon, L. A. J. Documents Inedits sur la Grande Peste de 1348, Paris, 1860.

[53] In Michon, L. A. J. *Op. cit.*, and Sudhoff, K. *Op. cit.*, pp. 65–76. This document is listed, but not quoted in Chartularium Universitatis Parisiensis, 2: No. 1159.

[54] The Tractate of John of Burgundy [Sir John Mandeville,] 1365, analyzed in Singer, D. W. *Op. cit.*

[55] The Tractate of Pietro de Tossignano, 1398. Analyzed in Singer, D. W. *Op. cit.*

[56] In the introduction to his poem, Simon de Covino described this conjunction of the planets. Saturn had invited all the gods to attend a feast in his house, which is in Aquarius, and all the gods had been there during the first three months of 1345, although all did not come at the same time. There a quarrel arose between Saturn, who was hostile to man, and Jupiter, who defended mankind. Mercury also argued against the human race, and set forth the list of crimes for which mankind had not been punished since the flood. Then Jupiter deserted the defense of the human race, and gave it up to just punishment. The Sun pronounced the sentence and condemned mankind to pestiferous death. Saturn caused vaporous clouds to bear this death to earth.

Simon de Covino was supposed to have predicted the plague, and also the Hundred Years' War.

grande mortalité, as he called it, and the bubonic type which prevailed for the rest of the time at Avignon. The first type was characterized by continual fever and by the spitting of blood. One died of it in three days. The bubonic type was characterized by fever and by boils, especially in the armpits and groins. Some patients recovered from the latter type, especially toward the end of the epidemic when the plague was more mild.

He recognized the danger of contagion as being so great that not only by dwelling with it, but even by regarding it, one could contract the disease. Consequently it required a good deal of courage for him to visit the sick, for he realized the futility of treatment in most cases. He continued to treat patients in spite of his fears, and contracted the disease, but recovered.[57]

He advised all who could to flee from the epidemic. Those who could not, or would not, such as his patron, Clement VI, he urged to purify the air they breathed by keeping fires burning, and fires of juniper and such woods burned constantly in the papal palace at Avignon.

The treatment he prescribed consisted in purging with aloetic pills, diminishing the blood by phlebotomy, "comforting the heart" with "theriacs" and "pommes ambres" and things of good odor, "consoling the humors" with "Armenian bole," and resisting putrefaction by the use of bitter or sour foods. He prescribed poultices for the boils. These were made of figs and cooked onions mixed with yeast and butter. After poulticing, he recommended opening the boils and treating them as ulcers. Carbuncles he scarified and cauterized. His treatise ended with an elaborate recipe for a "therical electuary" containing innumerable things: from lemon seeds to sapphires and emeralds, red coral and mint. To the use of this electuary he attributed his recovery from the plague.

Jean Jasme wrote his treatise on the plague in 1373. He lived to witness all four of the epidemics of the fourteenth century. He accepted the explanation that the "celestial spirits and humors" were responsible for the epidemic, but pointed out terrestial causes. The first of these terrestial causes was bad sanitation in the houses, which gave rise to fevers. Stagnant water, or the rotting corpses from the wars caused universal fever or plague. Some people were more susceptible to plague than others, because of their humoral complexion.

He realized that the plague was contagious. He believed that it was contracted from the air, which had been corrupted by the bodies of plague victims. He advised doctors to stand far away from their patients and to face the door or window. Windows in the patient's room should be kept open, if they were on the north or east side of the house.

To those who could go away, he recommended flight. Those who had to remain in infected regions should avoid crowds and stay indoors as much as possible, especially on rainy or misty days. Fires should be kept burning to purify the air, and houses should be sprinkled with rose water and vinegar. The frequent washing of hands and face in this mixture was also recommended by Jean Jasme. He advised people to carry a sponge saturated with vinegar instead of *pommes ambres*, as the latter attracted corrupt vapors to the heart.

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[57] Gui de Chauliac died in 1368, during another epidemic of the plague, and most of his biographers believe that his death was due to a second attack of the plague.

He advised his patients to eat lightly, and to drink light wines moderately. Heavy meats and fish should be avoided. Acid fruits should be used as medicine rather than food. Other fruits should not be eaten. Gentle exercise should be taken in "some place where neither the sun nor the rays of the moon penetrate." People should sleep only at night, or at long intervals after meals. Baths should be avoided, as should anger and all violent emotions which would open the pores of the skin and allow corrupt air to penetrate to the heart. Phlebotomy once a month was recommended for those who were strong enough to stand it.

In his treatment of patients Jean Jasme distinguished between those afflicted with boils and those who did not have them. The latter were treated by mild phlebotomy and diet as for any acute fever. An "electuary" should be given for the heart. Those patients upon whom boils appeared were also treated by phlebotomy and "theriac" was given if a boil formed in the heart. "Theriac" should not be used on the boils, however, because it would drive the poison into the body. He believed that cauterizing was too harsh a treatment for the boils, and used plasters on them. He included recipes for these plasters. Surgeons should be called to treat broken boils. At the conclusion he appealed "if I have said aught ill, let it be suppressed with gentleness, and if aught good, let it be received with joy."

Raymond Chalmel de Viviers was also at Avignon during the plague of 1348, and lived to observe the recurrences of it in 1360, 1372 and 1382. His treatise was written in 1382. He believed that the universal cause of the plague was the conjunction of the planets in March, 1345, and attributed the epidemic of 1372 to a conjunction of Jupiter and Mars in the sign of Taurus in March of that year.

He divided his treatise into three parts, in honor of God and the Trinity. In the first part he dealt with the causes of the pestilence, in the second he explained the preservative regimen and in the third he considered the curative regimen. He noted two types of the disease, in one of which the patient suffered with fever and boils, while in the other type, fever, but no boils appeared.

He recognized that the plague was communicable, and asserted that any endemic disease might become epidemic. He believed that all pronounced cases of the plague were incurable, and so justified doctors who cared for their own safety, since the danger was so great and the good they could do was so small. "No one is so blind and senseless that he should care more for the salvation of others than for his own, particularly in the case of so infectious a disease."

He could not have followed his own teaching in this respect and have left so detailed a description of the symptoms of the plague, for he noted some symptoms ignored by other doctors. He noticed that bleeding from the nose, the presence of blood in the urine and fluxes of blood from the bowels resulted in the death of the patient on the same or the following day. He described the black spots which appeared on the bodies of the plague victims, and also a solid cord, red or discolored, which sometimes appeared, with a carbuncle at one end and a tubercle at the other. He noted an inflammation of the throat in some patients, accompanied by a difficulty in swallowing which sometimes caused suffocation. These patients also experienced an inflammation of the wax-secreting glands of the ears, and suffered from tumors. Such cases were characterized by the spitting of blood, and the patients usually died on the sixth, but sometimes not until the fourteenth day.

He did not use phlebotomy except for patients who had a great deal of strength, as he believed that more harm than good was done by it. He preferred cupping or the use of leeches. If a patient had no fever, he cauterized the boils, as did Gui de Chauliac. Otherwise he opened the boils and cleansed them with vinegar. He also used plasters and included recipes for them.

The treatise of the anonymous doctor of Montpellier, written in 1349, may be the work of a master in the faculty of medicine, or a doctor who had received his training there. It is usually accepted as such. He addressed his treatise to all universities, and especially to the school of medicine at Paris.

He attributed the epidemic to the conjunction of Mars, Jupiter and Saturn in 1345. He pointed out as a specific cause the heavy rains and floods which had occurred, and the corruption caused by rotting plants and animals.

He emphasized the contagion of the disease, believing all were appointed to die who breathed the "air of the sick." He went so far as to say that the disease could be contracted by looking into the eyes of the patient, especially when he was in agony, for the poison was thrust from the brain to the ears and eyes of the dying person. So doctors, priests and anyone visiting the patient should have him close his eyes and place a cloth over them. The doctor should hold a sponge soaked with vinegar to his nose to avoid breathing the "air of the sick," or hold rue or cummin in his hands.

As for preventive measures, care should be taken to keep the stomach healthy, since this organ was the first attacked. This could be done by medicine, and he gave a recipe for such a powder containing black pepper and cummin. A light diet and moderate drinking were recommended. One should avoid violent exercise or violent emotions. He advocated seeking the advice of a skillful physician to keep the body strong, since "the air did not infect unless the body was full of bad humors, and was thin and weak."

He noted the appearance of boils and fever and spoke of a roaring in the ears, which none of the other doctors mentioned. He also observed that the pulse in patients was rare and weak, but not sluggish.

He was more interested in tracing the course of the poisons through the system than in describing remedies. The liver became affected by the poison from the stomach, and the "blackish blood ran with its overloading from the stomach" to the lungs and brain. In the lungs it stayed in the canals and prevented the motion of the lungs, and so the cooling of the heart was stopped and fever arose, causing the external and internal boils.

This treatise is filled with astrology and superstition, and the result is confusing. The document has been included among those of Montpellier doctors partly because it was written in that city and partly because it has been called a "true product of Montpellier" by an author[58] who denounced it as a document which "displays even more speculation than the Paris document, recurs more often to Avicenna, contains far more pure Galenism," and has in it "no vestige of observational activity." In the same article the writer refers to the "clear-cut symptomatology of Chalin de Vinario," who is generally accepted as of Montpellier origin, and the "pithy and exact advice of Gui de Chauliac," who was a product of Montpellier.[59]

Among the treatises by doctors from other medical schools, the most interesting is that drawn up by the members of the faculty at Paris at the request of Philip VI, who wished their opinions on the cause and cure of the plague. This document began by assigning the general cause of the plague to the conjunction of the planets in 1345. It pointed out a particular cause in the corrupt vapors which, arising from swamps, pools and dead bodies, penetrated to the heart and lungs, causing death.

The doctors who drew up this document recognized that the plague was communicable, and so they recommended flight from infected regions as the best means of avoiding the disease. They believed that the air was poisoned by the breath of plague victims. The corruption in the air could be dispelled by burning laurel, wormwood and other green woods. Fires should be kept burning not only in the houses, but in the market places, and other localities where many people congregated.

They recommended a simple diet, and prohibited the use of fish, except small river fish, poultry, water fowl, pork, old beef, olive oil, beets and fruit, unless it was taken with wine. They recommended the use of herbs and spices. They believed that fasting was as harmful as excessive eating and drinking. They advised sleeping only at night, taking moderate exercise and avoiding exposure. They believed that bathing was injurious, and also that giving way to violent emotions was harmful.

The sufferers from the plague should be treated by phlebotomy and purgatives. Medicines and antidotes were prescribed and recipes for them were given. There were also recipes for "pommes ambres" and "electuaries" to preserve people from the poisonous air, fever and the pestilence.

John of Burgundy, or John à la Barbe, "a citizen of Liège and professor of the art of medicine," has been identified as the author of the "Travels of Sir John Mandeville." He accepted planetary influence as the universal cause of the plague. The particular cause was the corruption of the air brought about by astral influences. The poisonous vapors did not affect everyone in the same way, however, because the humoral complexion of the body determined the nature of the disease caused by the corrupt air.

He addressed his treatise to the

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[58] D'Irsay, S. The black death and medieval universities. ANN. MED. HIST. 7: 220–5, 1925.

[59] Objection must be made also to the reference in the same article to "Montpellier, the alma mater of Armengaud Blaise." The choice of men is a poor one by which to judge the medical school. For Armengaud Blaise was made a master of the medical school by episcopal authority, over the protests of the masters of the faculty who had examined and rejected him as being found not capable.

layman, so that he could be his own physician. For this reason he concerned himself almost entirely with preventive measures. He recommended the usual fires of juniper wood to dispel the evil vapors in the house, and gave a recipe for a powder which could be scattered on burning coals for the same purpose. Windows should be kept closed. *Pommes ambres* should be carried to dispel evil vapors.

He prescribed a temperate diet, with wine and vinegar. Baths were forbidden, since they opened the pores of the skin and allowed evil vapors to enter and circulate through the humors of the body to the heart, liver, and brain, causing boils. Should these form, one must resort to phlebotomy. This treatment was prescribed also for the "flying, pricking sensation in the blood" which gave warning of the pestilence. He included recipes for the remedies which he suggested should be taken. He warned his readers against seeking the advice of doctors who knew a great deal about the theory of medicine but little about its practical side. To the laymen for whom the treatise was written he appealed at the end "not for a price, but for your prayers have I indited this work; let him whose health returns pray for me." This work of John of Burgundy was one of the most popular treatises on the plague. It was copied by many doctors and some of them published it as their own work.

Pietro de Tossignano studied medicine and surgery in Padua, and practiced and taught in Bologna and Padua. His treatise on the plague was written in 1398. He accepted the same celestial and terrestial causes for the plague as did the authors of the documents that have been described, and added that climatic conditions were sometimes responsible for the spread of the disease. He believed that the air should be purified by fires to dispel dampness and vapors. The preventive measures suggested by him are similar to those advocated by the authors of the other treatises. People should eat moderately and should sleep only at night. Phlebotomy was recommended as a preventive measure.

The disease sometimes began as a result of moistures, such as catarrhs, suffocating the natural heat of the body; or as a result of worms, generated by evil humors. It attacked the three principal organs of the body, the brain, the liver and the heart, and "comforts" for these organs should be given to the patient. Boils should be treated by surgeons, especially if they had broken; in which case they should be cleansed with vinegar. The doctor should not touch these boils if they had broken, for the discharge from them was poisonous and highly infectious.

It was upon this point that the treatise of Pietro de Tossignano differed from those of his contemporaries. He recognized sources of contagion other than the "air of the sick" and corrupt vapors. He mentioned "contact" as a cause of the disease. He believed that localities in which the plague had been prevalent should be avoided because the relics (reliquiae) of the disease remained and would infect those who went there. He referred to the dwellings of plague victims as "contagious houses."

Another Italian doctor who wrote on the plague was Gentilis de Foligno, who taught medicine at Padua and Perugia, and who died a victim of the plague in 1348. His treatise contained the same ideas as to the origin of the plague as were contained in the writings of his contemporaries. He believed that the vapors could be dispelled by burning odoriferous woods and by sprinkling vinegar and wine in the houses. Camphor also was recommended to dispel vapors. The usual medicines were prescribed by him, and the recipes for them given in his treatise. He also believed that the disease was communicable and recommended flight as the best means of avoiding the pestilence.

Under the direction of this doctor, plague victims were dissected at Perugia. In other cities of Italy also the bodies of plague victims were dissected in an effort to discover the origin and effects of the disease. Some accounts stated that medical men believed death was caused by a small boil which formed near the heart, and spread its poison throughout the system. Clement VI is supposed to have ordered the dissection of bodies in Avignon. There, according to the unknown canon at the papal court "Many dead bodies have been opened and dissected, and it is found that all who have died thus suddenly have had their lungs infected and have spat blood."

However, Gui de Chauliac, who was at Avignon during the plague of 1348 and who was physician to Clement VI makes no mention of this fact. It would seem that if dissections had been ordered by Clement VI, it would have been Gui de Chauliac who would have made them, since he was the foremost surgeon of his day.

The influence of astrology on fourteenth century medicine was so strong that all the doctors of the period readily accepted it as a cause of the pestilence. A disaster of such proportions and virulence as the plague of 1348 came as a great shock to the profession, and it was to be expected that they turned to supernatural causes for an explanation of it. Nothing in their own experience helped to explain it. They had no well-formulated ideas about disease, and the scientific method of studying disease and its causes was unknown to them. Anatomy and physiology as we know them today were not studied. Physicians knew the ancient authors, and the commentaries of later doctors regarding them, but these commentaries often served to obscure the original ideas. Thus the teaching of Hippocrates that no disease is more human or divine than any other, and that all arise from natural causes, was hidden by the superstitions and beliefs in astrology which prevailed.

While all of these doctors accepted the conjunction of Mars, Saturn and Jupiter as the general cause of the pestilence, that explanation satisfied none of them. All looked for more specific causes, near at hand. However, the ideas on poisonous air and corrupt vapors which were generally accepted by medical men served to confuse them, and kept many of them from searching out other causes of the plague. They looked for things that would poison the air, and found them in rotting plant and animal life, in swamps and stagnant water, and in the "air of the sick." They did not realize that the plague was spread by the conditions of filth in which they lived, and in their habitual violation of all rules of sanitation. They all realized that the plague was communicable, but only Pietro de Tossignano, writing in 1398, understood the means of the contagion.

In some of the Italian cities public measures against the plague were taken. The most stringent regulations were issued by Viscount Bernabo in Reggio in January, 1347. According to these regulations plague patients were taken outside of the city walls to recover or to die. The priests were to examine the diseased and point out those who were victims of the plague. The state condemned the goods of anyone who brought the plague into the city. Certain persons were appointed to care for the plague victims, and these people were isolated. In 1383, when there was a recurrence of the plague, people from infected regions were forbidden to come into Reggio on pain of death. In Milan three houses, whose inhabtiants had become infected with the plague, were barricaded and so the spread of the disease was prevented. In Piacenza plague victims were isolated in hospitals. It was there that St. Roch contracted the disease. He left the hospital because he did not wish to disturb other patients, and was driven outside of the gates of the city by the police. In 1348, the Great Council of Venice appointed three men to care for the public health. They ordered deep pits to be dug on one of the islands and plague victims were buried there. Probably these measures were due more to the intelligence of the rulers of these cities than to any action taken by the members of the medical profession.

The medical profession as a whole ignored public health. The first suggestion that public measures should be taken was made by the faculty of Paris when it recommended that juniper and other odoriferous woods be burned in the market place. The doctors did not protest against the filth and overcrowded conditions in the cities. The bodies of plague victims were buried within the cities, in shallow pits, where rats and mice could feed upon them and spread the infection further. The marvel is that anyone remained alive. The plague gradually abated, not because of what the physicians did to fight it, but because the organism which caused it naturally lost its virulence as it became accustomed to the human body.

The prevalent theory regarding humors in the body, and the results of the predominance of any one of the humors, was so firmly fixed in the minds of the doctors that they could not see beyond it, and so could not understand the development of the disease in the body. None of the authors of plague treatises expressed practical ideas on this subject. The same thing was true in regard to the remedies they used. The elaborate and often ineffectual medicines prescribed by the doctors were copied from Galen and the Arabian physicians.

This was the natural result of the scholastic method of teaching followed in the medieval universities, which served to discourage individual ideas. The acceptance of authority was the outstanding characteristic of the teaching of the time. In medicine, the principal authority was Galen, as he had been interpreted by Arabian translators. The doctors, therefore, were more inclined to try to fit the epidemic as a whole into the systems of Galen than to study, with independent minds, individual cases of the plague. There are no case histories among the fourteenth century documents on the plague.

However, these treatises were not entirely without value. The descriptions of the disease made by these doctors were sufficiently ample and accurate to prove that the disease was the plague. Most of them differentiated between the pneumonic and bubonic types of the plague as manifestations of one and the same disease. They observed that sufferers from the pneumonic type soon died, while those afflicted with the bubonic type sometimes recovered, which is characteristic of the plague.

Some of the doctors pointed out that the physical condition of the body was an important factor in the development of the disease. All of them recognized the effects of diet in the treatment of the plague. They laid down rules for wholesome living: regular sleep, exercise, moderation in eating and drinking, as preventive measures against the plague. These ideas were not new, but they assumed a new importance because they were included in these treatises. And most of these documents were copied many times and were circulated throughout Europe during the next two centuries. The ideas they contained on personal regimen, being constantly repeated, were bound to affect the habits of people.

And so these writings of fourteenth century physicians were important; not because they did much to help the victims of the plague or to stop the spread of that disease, for they did not. They were important because they show the beginnings of some of our modern ideas regarding personal regimen and its importance in avoiding disease and because, through the constant repetition of these ideas, they affected public health in Europe.

THE DECLINE OF THE MEDICAL SCHOOL AT MONTPELLIER

Toward the end of the fourteenth century teaching at Montpellier declined in both the legal and medical faculties, but this decline was greater in the medical faculty. In 1378 only fifty-six names of students and graduates in the school of medicine appeared on the roll petitioning the Pope for benefices, as against three hundred and eighty names of students and graduates in law. Pansier, who was able to identify about two hundred masters and students of medicine at Montpellier in the fourteenth century, identified less than seventy for the fifteenth century. This decadence was not limited to Montpellier. There was a general decline in universities throughout Europe at this time, and the advancement in learning made during the twelfth and thirteenth centuries was checked until the Renaissance.

One of the chief causes of this general decline in learning at the end of the fourteenth century was the frequent recurrences of the plague, which had destroyed the greater part of the population of Europe, and disorganized social and economic life. Lands had been left without tenants and cities without workers. Land values had decreased and the cost of living had increased so that many students could no longer afford to attend universities. Also, the mortality of the plague had been especially great among doctors, and medical faculties declined.

At the same time, the people of France had to meet the cost of the Hundred Years' War. New taxes, such as the gabelle, were levied for this purpose. Coinage was depreciated. In addition to the hardships caused by these things, the Midi was ravaged by the armies of both England and France. Especially after the Battle of Poitiers in 1356, organized bands systematically plundered the country.

Townspeople everywhere were dissatisfied. Wages had not increased with the cost of living and taxes, and people protested that they could not pay their taxes. These protests were followed by rebellions against royal authority. Montpellier rebelled against the Duke of Anjou in 1378. When he took possession of the city again he killed six hundred citizens and confiscated the property of many others to punish the city for the revolt. This struggle affected the university, for students naturally sought more peaceful places in which to pursue their studies. Many went to Perpignan, or Lerida, or Padua, where the medical faculties had become more important during the last years of the fourteenth century. Doctors also were attracted to those universities from Montpellier, because in those schools salaries were paid and Montpellier had no endowed chairs and paid no salaries at this time.

French annexation may have been a factor in the decline of medical teaching at Montpellier, since it ended the close contact of the school with Spain. This would seem to be a minor consideration because Spain was no longer a source of inspiration at the end of the fourteenth century. French kings extended their help and protection to the masters and students at Montpellier. They exempted them from taxes on their property and the seizure of their goods for debt, and even deputized special officials to enforce these safeguards. They interested themselves in the medical faculty especially, recognizing and encouraging surgery and providing the bodies for dissection which made possible the practical teaching of surgery.

After the popes returned to Rome they no longer showed much interest in Montpellier, and the authority over the school of medicine passed from the hands of the Bishop of Maguelone to the consuls of Montpellier. This was unfortunate, since it was the power exercised by the Bishop of Maguelone that had protected the medical school from the interference of political authority. The consuls, on the other hand, quarreled with the masters and students over taxes and privileges, and were more interested in the welfare and prosperity of the city than in the development of the university. The consuls seem to have assumed a great deal of authority over the school, for in 1394, Clement VII addressed the consuls of Montpellier in favor of a licentiate in medicine who wished to present himself for the mastership.

It was to the consuls also that the students appealed in 1390 to avert "the trouble and future ruin and destruction" which threatened the university as a result of the "irregular and unjust administration of the instructors in power." This complaint set forth the principal causes of the decline of the university, and showed how bad conditions had become. The students claimed that only the former glory of Montpellier upheld the reputation of the school at that time. The masters quarreled openly and publicly, to the discredit of the school, and the young masters had no respect for the older doctors. The students brought charges of "unrestrained cupidity" against the masters, who, according to the complaint, extorted as much money as they could from candidates for degrees, "questioning not the test of their knowledge but of their purses," and promoted not those who were well informed but those who could pay heavy fees. In this way they had conferred degrees upon "apothecaries ignorant barbers and mere laymen." They even ignored the residence requirement in granting degrees. This was contrary to the regulations of the university, and yet no one punished the masters for these violations of rules. So bad had conditions become, and the reputation of the university had suffered so much as a consequence, that "other notable and scientific men, seeing this, although of the same university, would almost have preferred to have been graduated from another."

Those in authority did what they could to prevent the decline of the university. Urban v, who had been a student in the law school at Montpellier, founded and liberally endowed the Collège des Douze Médecins in 1369, to house and care for twelve medical students from his own diocese, Mende. This was the only medical college at Montpellier in the fourteenth century, and may have been the first to be established in Europe. In 1422, however, only one student was living in this college, which would indicate how few students attended the medical school of Montpellier at that time.

The causes of the decline of the medical school, and of learning in general, were too deep-seated to be overcome by anything that popes or kings could do. Europe needed time and peace to recover from the plague, and to regain her economic and political prosperity. When this recovery was complete, men again turned to culture and the Renaissance ensued. Then the school of medicine at Montpellier regained its former reputation.

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BIBLIOGRAPHY

The leading historian of Montpellier was Alexandre Germain, who was professor of history at the University of Montpellier for forty seven years (1839–1886) and dean of the school for twenty years (1861–1881). He wrote the Histoire de la Commune de Montpellier, which contains a history of the university, and the Histoire du Commerce de Montpellier, 2 vols., Montpellier, 1861, which I have not seen. He also wrote many monographs on the various faculties of the university, most of which were published in the Memoires de la Société Archéologique de Montpellier during the years 1860 to 1882. Through the courtesy of the Inter-Library Loan Service and the Harvard College Library I have been able to use the following of these monographs:

La Médecine Arabe et la Médecine Greque à Montpellier, 1879.

Du Principe Démocratique dans les Anciennes Écoles de Montpellier, 1881.

L'École de Médecine de Montpellier ses Origines, sa Constitution, son Enseignement, 1880.

L' Apothecairerie à Montpellier sous l' ancien Régime Universitaire, 1882.

The two latter monographs have been printed with the Historia Monspeliensis of Etienne Strobelberger and the Apollinare Sacrum of François Ranchin in a volume called Médecine de Montpellier by Alexandre Germain.

Alexandre Germain planned to write a history of the University of Montpellier, but was not able to do so. However, he wrote a splendid introduction to volume 1 of the Cartulaire de l'Université de Montpellier, which was published in 1890. This volume contains documents pertaining to the history

of the university to the year 1400. After its publication, an inventory which had been made in 1583 was found, and it is included in volume II of the Cartulaire de l'Université de Montpellier, which was published in 1912. The Inventaire de 1583 was the first attempt to make an inventory of the documents pertaining to the history of the university. At that time the documents were classified and were placed in bundles, and the inventory was made, giving the classification of each document and a brief description of its contents. Some of the documents listed in this inventory have been lost, but an idea of their importance can be obtained from the description of them given in the Inventaire de 1583.

Books which are mentioned by Rashdall and other writers on the University of Montpellier, but which I have not been able to obtain are:

ASTRUC. Memoires pour Servir à l'Histoire de la Faculté de Médecine de Montpellier, Paris, 1767.

D' AIGREFEUILLE, CHARLES. Histoire Ecclesiastique de la Ville de Montpellier. Montpellier, 1737.

PRUNELLE. Fragmens pour Servirà l'Histoire de Progrès de la Médecine dans l'Université de Montpellier. An 9.

I. BIBLIOGRAPHIES

CHEVALIER, U. Repertoire des Sources Historiques du Moyen Age: Bio-bibliographie. 2 vols. Revised ed., Paris, 1903–07.

FRANKLIN, A. Les Sources de l'Histoire de France: notices bibliographiques et analytiques des recueils de documents relatifs à l'histoire de France. Paris, 1877.

MOLINIER, A. Les Sources de l'Histoire de France. Vols. 1–6 on the Middle Ages. Paris, 1901–06.

PAETOW, L. J. Guide to the Study of Medieval History. Berkeley, 1917.

II. PRIMARY SOURCES

Cartulaire de l'Université de Montpellier, publié sous les auspices du Conseil général des Facultés de Montpellier. 2 vols., Montpellier, 1890–1912.

DE CHAULIAC, G. La Grande Chirurgie, composée en l'an 1363. Revue et collationée sur les manuscripts et imprimes latins et français, par E. Nicaise, Paris, 1890.

DE COVINO, S. Libellus de judicio Solis in conviviis Saturni. In Opuscule relatif à la peste de 1348, composé par un contemporain, et publié par M. E. Littré in Bibliothèque de l'École des Chartes, 2: Sér. 1, 201–243.

FOURNIER, M. Les Statuts et Privilèges des Universités Françaises depuis leur Fondation jusqu'en 1789. 4 vols., Paris, 1890–1894. Contains most of the documents relative to the school of medicine that are listed in the Cartulaire de l'Université de Montpellier, I.

KLEBS, A. C., et DROZ, E. Remèdes contre la Peste, Facsimilés, Notes et Liste Bibliographique des Incunables sur la Peste. (Documents scientifiques de XV siécle, I.) Paris, 1925.

MICHON, L. A. J. Documents Inédits sur la Grande Peste de 1348. Paris, 1860.

SUDHOFF, K. Pestschriften aus den ersten 150 Jahren nach der Epidemie des schwarzen Todes, 1348. *Arch. f. Ges. d. Med.* 17: 23–29, 1909–16.

III. SECONDARY WORKS

AUBER, T. C. E. Traité de la Science Médicale, Histoire et Dogmes. Paris, 1853.

BAAS, J. H., Grundriss der Geschichte der Medizin und des heilenden Standes. Trans., and in conjunction with the author revised and enlarged by Handerson, H. E. Outlines of the history of medicine. N. Y., 1910. A biased account but contains some good biographical material.

BERTHAUD, H. Les Médecins et Chirurgiens des Rois Capetiens du Onziéme au Treizième Siècle. Reprint from *Bull. soc. Franc. de l' hist. de la méd.*, 1907.

BROWNE, E. G. Arabian Medicine. Cambridge, 1921.

CRAWFURD, R. Plague and Pestilence in Literature and Art. Oxford, 1914.

CUMSTON, C. G. An Introduction to the History of Medicine from the Time of the Pharaohs to the End of the Eighteenth Century, N. Y., 1926.

DAUNOU, M. Discours sur l'Etat des Lettres en France au XIIIe Siècle. In: *Hist. Litt. de la France*, 16: 1–254, 1892. An excellent general account.

DENIFLE, H. S. Die Enstehung der Universitäten des Mittlelalters bis 1400, I. Berlin, 1885. The only volume completed out of five that were planned by the author. Contains a short, but valuable account of the University of Montpellier.

D'IRSAY, S. The black death and the medieval universities. ANN. MED. HIST., 7: 220–225, 1925.

Gasquet, F. A. The Great Pestilence (1348–9), now Commonly Known as the Black Death. London, 1893. The best and most complete account in English of the plague of 1348.

Garrison, F. H. An Introduction to the History of Medicine. Ed. 4, Phila. Saunders, 1929. Contains excellent biographical data.

Germain, A. Histoire de la Commune de Montpellier, 3 vols. New ed., Montpellier, 1871. The most complete account of the history of Montpellier.

Germain, A. Étude sur l'Origine de l'Université de Montpellier. In Devic, C. and Vaissette, J. Histoire Générale de Languedoc. New ed. in 15 vols. Toulouse, 1872–1904, 7, pt. 1, 609–610.

Haskins, C. H. The Renaissance of the 12th Century. Camb., 1927. An excellent treatment of the Latin side of the culture of the twelfth century. Contains a critical bibliography.

Haskins, C. H. Studies in the History of Medieval Science. Camb., 1924.

Hauréau, B. Arnauld de Villeneuve, Médecin et Chimiste. *Hist. Litt. de la France*, 28: 26–126, 1881.

Hecker, I. F. C. Die grossen Volkskrankheiten des Mittelalters. Berlin, 1832. Trans. by Babington, B. G. The Epidemics of the Middle Ages. 1859. A brief, but authoritative account which discusses the medical as well as the historical aspects of the plague.

Le Clerc, L. Histoire de la Médecine Arabe, exposé complete des traductions du Grec. Paris, 1876. The best account of the Arabic translations and translators.

Nohl, J. Der schwarze Tod; eine Chronik der Pest 1348 bis 1720, unter bezutnung Zeitgenössischer quellen bearb. Potsdam, 1924. Trans. by Clarke, C. H. The Black Death. London, 1926. A general account of the various plague visitations to the eighteenth century.

Pansier, P. Les Maîtres de la faculté de médecine de Montpellier au moyenâge. *Janus*, 9: 503, 1904; 10: 2, 1905. An invaluable list of masters and students of the medical faculty from the twelfth to the sixteenth century, with biographical data on many of them.

Pouchet, F. A. Histoire des Sciences Naturalles au Moyen Age. Paris, 1853.

Rashdall, H. Universities of Europe in the Middle Ages. 2 vols. in 3. Revised ed. Oxford, 1895. The standard work on medieval universities.

Rivet, A. Etat des lettres en France dans le cours de ce siècle [twelfth]. *Hist. Litt. de la France*, 9: 1–225, 1868. A good general account.

Simpson, W. J. R. A Treatise on Plague, dealing with the Historical, Epidemiological Clinical, Therapeutic and Preventive Aspects of the Disease. Camb., 1905.

Singer, C. A review of the medical literature of the dark ages, with a new text of about 1110. *Pvoc. Roy. Soc. Med.* 10: pt. 2, 107–160, 1916–17.

Singer, C. Greek Biology and Greek Medicine. Vol. I of Chapters in the History of Science. Ed. by Charles Singer. Oxford, 1922.

Singer, D. W. Some plague tractates (14th and 15th centuries). *Proc. Roy. Soc. Med.*, 9: pt. 2, 159–212, 1915–16.

Strobelberger, E. Historia Monspeliensis. Nuremberg, 1625.

Thorndyke, L. The blight of pestilence on early modern civilization. *Am. Hist. Rev.*, 32: 455–474, 1927. Shows the effect of the plagues of the fourteenth, fifteenth and sixteenth centuries on civilization.

Thorndyke, L. History of Magic and Experimental Science. N. Y., 1923.

Vaissette, J. La peste ravage la Languedoc et emporte une grande parte de ses habitans. Histoire gén. de Langue d'Oc, 9: bk. 31, pp. 608–609. The notes in this brief account are valuable.

Walsh, J. J. The Popes and Science, the History of the Papal Relations to Science during the Middle Ages and Down to Our Own Times. N. Y., 1908. A biased, but good account.

Walsh, J. J. Old Time Makers of Medicine. N. Y., 1911. Contains excellent material on the work and ideas of early physicians.

Withington, E. T. Medical History from the Earliest Times: a Popular History of the Healing Art. London, 1894.

Wu Lien-Teh. A Treatise on Pneumonic Plague. Geneva, 1926. A publication of the League of Nations' health organization. A description of modern conditions.

de Wulf, M. Histoire de la Philosophie médiévale. 2 vols., trans. by E. C. Messenger. London, 1925–6.

THE IRISH SCHOOL OF MEDICINE*

By J. DUFFY HANCOCK, M.D., F.A.C.S.

LOUISVILLE, KENTUCKY

BEFORE beginning a discussion of those trail-blazing clinicians, who in the first part of the 19th century gave rise to the Irish School of Medicine, it might be interesting to review briefly the evolution of medicine in Ireland from the earliest times. Such a procedure will show that the development of that school was not an accident but rather a thing to be expected when the traditions and accomplishments of their predecessors were of such a high order in comparison with others of that same early time.

The earliest colonizers of Ireland were principally Celts and came from Southeastern Europe, sweeping upward across what are now Greece and France. With them they brought all their arts and customs including the Brehon Laws, the most ancient code in Europe, to which we shall refer later in a discussion of regulations pertaining to medical practice.

The first Irish physician, Capa (2000 B.C.), is known by name only, all records concerning him and his work having disappeared. He was probably a member of that craft (hypnotists, herbalists, priests, astrologers, etc.) known as druids. It is certain, that most of the early physicians were, and included in this lot was Diancecht (400–500 B.C.), the first authenticated physician concerning whom we have definite evidence. He did some primitive surgery as well as healing by medicine. His greatest contribution to mankind was probably his Elixir of Life, described as a "preservation for the dead, the living, for the want of sinews, for the tongue-tied, for swelling in the head, of wounds from iron, of burning from fire, of the bite of the hound; it preventeth the lassitude of old age, cures the decline, the rupture of the blood vessels, takes away the virulence of the festering sore; the poignancy of grief, the fever of the blood, they cannot contend with it, he to whom it shall be applied shall be made whole." These extravagant claims remind one of the tar water mania of Bishop Berkley to which Oliver Wendell Holmes alludes in one of his works. Unfortunately for posterity, Diancecht's formula has been misplaced.

The date 300 B.C. is of considerable importance. It was then that the Irish princess, Macha, established the House of Sorrows, one of the two earliest public hospitals in the world, the other being established at about the same time in the far East. While there were earlier organized efforts to furnish care for the sick these efforts were generally limited to members of a clan, tribe, or family, while Princess Macha's effort seems to mark the beginning of the modern general public hospital. This House of Sorrows was in operation for many years. Later it was taken over by the Red Branch Knights and finally became the Royal Ulster Residence, continuing so until its destruction in 332 A.D. It may be of interest to some to know that these Red Branch Knights had a taste for war trophies comparable to, but more terrifying than, that of our

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* Read before the Innonimate Society, Louisville, Ky., 1928.

American Indians. Their most prized battle souvenirs were balls composed of the brain substance of various distinguished fallen foes.

At about the time of Christ, Conner Macnessa, King of Ulster, sustained, in battle, a fracture of the skull with contusion of the brain. The fragment was not removed and he recovered under palliative treatment. It is to be regretted that the name of his physician is not recorded since the latter's advice for future conduct was founded on such sound principles. Conner was told "for the future to keep his spirits cool and in proper motion and to avoid horseback riding, mental excitement, anger and all things that might disorder or ferment his blood." He followed this advice for years, but upon hearing of the crucifixion of Christ he became most angry and hewed trees (symbolical of the Jews) until he dropped dead, since when he has been considered by many as "the first man who died for the sake of Christ in Ireland."

The Irish physicians at this time were highly regarded by the general public. Their work was usually limited to their own clan or tribe. At first the position was largely hereditary, but later pupils other than the doctor's own sons were admitted to study.

The laws governing medical practice were part of the previously mentioned Brehon Code. Among the regulations of interest were first a division of physicians into the lawful and the unlawful. The unlawful could practice but he must give notice in advance that he was not a lawful doctor or he would be held strictly liable for any unfavorable results. Secondly, the fees were based on a sliding scale and were apparently fair enough. For example, the fee for curing a bishop was 42 cows, that for a prince or wealthy merchant was a year's wages of an ordinary laborer, that for a slave, one-sixth as much. Further, the bill was practically always paid, if not by the patient, then by the nearest relative or the clan to which he belonged; or if inflicted by a transgressor the latter was required to pay. In addition to the prescribed fee the physician was allowed food for himself and as many as four students. Thirdly, there was an attempt at regulation of a statute of limitation and also a definition of responsibility. Fourthly, physicians were generally given grants of land in order that they might have time and means for an occasional period of rest and study. Fifthly, dogs, fools and female scolds were prohibited from visiting at the hospitals. As the physician's house was generally considered a hospital, it is interesting to know that those houses were built near running water, that they had four doors, one on each side and the one facing the wind left open and that they were often near a sweating house. It is believed by some that the custom of half-doors began then, the lower half being closed for protection and the upper half open for ventilation. At any rate these doors became quite common among the peasants later and probably prevented an even higher mortality than did occur among the class living in windowless huts.

During the first four or five centuries of the Christian era, the physicians did good work as is shown by the fact that their reputation outlived that of any of the other professions. There were few, if any, definite scientific contributions but so far as actual practice was concerned the Irish doctors were far ahead of those of most other nations. Some of the procedures with which they were familiar were the use of heat and sweating, cupping, treatment of plagues, cauterization of wounds, control of fractures, Cesarian operations, and trephining. One trephine case resulting in the cure of amnesia was gravely reported as an operation for the removal of the organ of forgetfulness (I wonder if this is not the earliest Irishism). Their confidence in curative medicines is well evidenced by the following cure for baldness:

> With mice fill an earthern pipkin, stop the mouth with a lump of clay, and bury beside a fire but so that the fire's too great heat reach it not. So be it left for a year and at a year's end take out whatsoever may be found therein. But it is urgent that he who shall lift it have a glove upon his hand lest at his fingers' ends the hair comes sprouting out.

This largely legendary age of early Irish medicine terminated about 500 A.D. as the Monastic Period in Ireland began. One of the earliest prominent doctors was St. Brecan who died in 578. Medicine began to be taught in schools founded by St. Patrick and his successors. A discussion of this period would be a subject in itself. In this paper it will be sufficient to say that there was continual improvement and preparation for the coming of the productive era of the first half of the 19th century when the following contributions were to be made; the introduction of hypodermic medication, the promulgation of Colles' law in regard to hereditary syphilis, the use of potassium iodide in the treatment of that disease, the advancement of clinical teaching, the description of Graves' disease, the description of Cheyne-Stokes' respiration, and the discovery of many heart facts, particularly in regard to aortic regurgitation and heart block. These advances were the products of the so-called Irish School of Medicine which included Graves, Corrigan, Stokes, Cheyne, Adams, Wallace, Colles and Rynd.

Three of these names, Stokes, Adams and Cheyne immediately group themselves together in our minds because of our familiarity with the Stokes-Adams' syndrome or heart block and with Cheyne-Stokes' respiration.

Robert Adams was born in 1791 and died in 1875. He was a member and president of the Royal College of Surgeons and was surgeon to the Richmond, Whitmore and Hardwicke Hospitals and was one of the founders of the Richmond Hospital Medical School. His prominence as an anatomist was undoubtedly due in some measure at least to the fact that he had the advantage of being trained in that subject by Abraham Colles. Among Adams' principal publications were "Rheumatic Gout," 1857, "Introductory Lecture," 1860, addressed to beginning pupils of medicine at the above-mentioned hospitals, and "Essential Heart-block," 1826, the one which has contributed most to his fame and will be considered later in our discussion of William Stokes. His "Introductory Lecture," sounds most modern and could well be given today. He urged the students to defer their medical education if they had not already acquired a thorough preliminary education. He emphasized the importance of bedside training and insisted upon daily punctuality for ward work at which time they should not be walkers merely but attentive listeners and observers. The moral side of the profession was stressed by his saying that from the moment a student enters into the profession his character comes and remains before the public, a public quick to notice even minor lapses. He assures them that while most cannot become wealthy in their work all can hope for a good living.

FIG. 1. ONE OF PRINCIPAL BUILDINGS OF TRINITY COLLEGE, DUBLIN.

FIG. 2. ROYAL COLLEGE OF SURGEONS, DUBLIN.

John Cheyne, another member of this trio, was born at Leith, Scotland in 1777, the son of a Dr. John Cheyne. In 1795, after graduation at Edinburgh, he entered the army and fought against the Irish. Four years later he returned to Scotland and for the next nine years worked with his father at the Leith Ordnance Hospital. He spent much of his time dissecting and was particularly interested in pathology. In 1809 he published three works on the diseases of children (including an article on croup). During that same year he went to Dublin where he observed that the physicians were more interested in symptomatology than in pathology. He located in Dublin and in 1811 was appointed physician to Meath Hospital. His paper on "Acute Hydrocephalus" was published in 1815. The *Dublin Hospital Reports* of 1818 contain Cheyne's original observation regarding rhythmical ascending and descending periods of respiration separated from one another by short pauses. Another publication of his at that time was the Report on the Hardwick Fever Hospital for 1818. There were no other noteworthy publications. He died in 1836.

The most prominent of the three men was William Stokes, a contemporary and friend of Robert James Graves with whom he worked at the Meath Hospital. He was born in 1804, the son of a prominent Dublin physician. Due to the latter's unorthodox views on methodical education and Stokes' own inclination, his early education was not very orderly. This was largely compensated for by close contact with his father's work and many friends distinguished in various fields of endeavor. He studied clinical medicine at the Meath Hospital, allied sciences at Trinity College and the Royal College of Surgeons, and then spent two years in Glasgow, principally in the chemical laboratory of a Professor Thompson. This was followed by work toward his medical degree at Edinburg. There he became stimulated by the magnetic personality of Professor Allison and developed that rare power of original observation and research which enabled him at an early age to take so prominent and foremost a place among the pioneers of medical science. He overcame his desultory habits of his youth and began that relentless application to work that characterized him thereafter.

Before he obtained any medical qualification he saw the wonderful possibilities of Laënnec's work and published in 1825 the first systematic treatise on the use of the stethoscope. There was considerable opposition to the value of this instrument and to him is largely due its adoption among Irish clinicians.

Shortly after this publication he received his degree at Edinburgh and returned to Dublin as Physician to the General Dispensary. The following year he succeeded to his father's position as Physician to the Meath Hospital and his association with Graves began. At once they began to reform the methods of teaching emphasizing the clinical side and stressing observation rather than cramming. That first year found him working hard in a great typhus epidemic and in the one next year he became infected and nearly died of the disease.

In April 1828 he was married to Miss Mary Black. Their home life was ideal. Her death many years later was a shock from which he never recovered. He had the following inscription engraved upon the stone over her grave:

> When the ear heard her, then it blessed her,
> When the eye saw her, it rejoiced,
> When the poor and suffering came unto her,
> They were comforted.

Stokes in 1832 diagnosed the first case of Asiatic cholera in Ireland. During the next few years he began his voluminous contributions to medical publications. From 1835 to 1837 he prepared his famous book "The Diagnosis and Treatment of Diseases of the Chest." This book established his reputation at once. While Laennec had concerned himself mainly with a description of various physical signs, it was Stokes who associated them with their symptoms. His descriptions are most vivid. The most important results of the researches embodied in the publication were:

1. The discovery of a stage of pneumonia prior to that described by Laennec as the first.
2. The observation that contraction of the side has sometimes followed the cure of pneumonia.
3. The recognition of a fibrous layer in the pulmonary pleura.
4. That paralysis of the intercostal muscles and diaphragm may result from pleuritic inflammation, causing a yielding or bulging of these muscles when exposed to the presence of liquid effusion.
5. The employment of the stethoscope as an aid to the detection of foreign bodies in the air passages.

Corrigan's comment on the book is probably representative of the opinion of leaders of that time. He said:

> It would have seemed almost impardonable heresy to have criticised or added to Laënnec's imperishable volume, and accordingly, until the appearance of Stokes' present work we have had little more than compilations in various shapes and forms of the original. It required power and talent of no ordinary range to add to the production, to supply the omissions, and to correct the errors of such a master.

Stokes continued with his teaching, writing and traveling. Many letters were written concerning the latter and here again his keen sense of observation is quite apparent. He did not take an active part in politics but was heartily in favor of Irish freedom.

With Graves, Colles and Corrigan he established the Pathological Society of Dublin in 1838 which had many flourishing years.

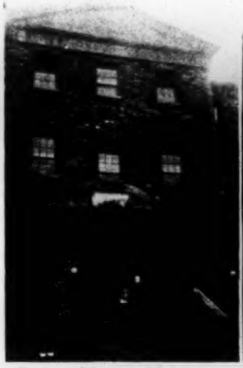

FIG. 3. MEATH HOSPITAL, DUBLIN.

FIG. 4. STEVENS HOSPITAL, DUBLIN.

FIG. 5. NEW HOSPITAL BUILDING AT SITE OF OLD JERVIS STREET HOSPITAL, DUBLIN.

In 1845 he succeeded his father as Professor of Medicine in the University of Dublin and the following year reported a case presenting the Stokes-Adams' syndrome.

He then began his preparation of the "Diseases of the Heart and Aorta," a book equal in importance and value to the previous one on "Disease of the Chest." The one on the heart was published in 1854. In it is the following description of "Cheyne-Stokes' respiration" in connection with the fatty degeneration of the heart:

> A form of respiratory distress, peculiar to this affection, consisting of a period of apparently perfect apnea, succeeded by feeble and short inspirations, which gradually increase in strength and depth until the respiratory act is carried to the highest pitch of which it seems capable, when the respirations pursuing a descendant scale, regularly diminish until the commencement of another apneal period. During the height of the paroxysm the vesicular murmur becomes intensely puerile.

Subsequent lectures on medical education were somewhat similar to those of Graves, Colles and Corrigan.

He died in 1778, beloved as a man, revered as a teacher and honored in every way a grateful profession could show its appreciation.

Probably the name most familiar in the entire group under discussion is that of Robert James Graves. This distinguished Irish physician was born in Dublin in 1796. Though the son of a clergyman, he seemed to have considerable means at his disposal for after graduating in medicine in 1818 he made a three-year tour of the various European clinics and schools. His spirit of adventure was quite satisfied by his arrest as a German spy and by his experience with a mutiny on a Mediterranean ship. As this showed the resourcefulness and leadership that were to aid him in his later work it will probably be proper to tell some of the details of the latter episode.

He had embarked at Genoa for Sicily, Graves and a poor Spaniard being the only passengers. In a storm the sails were blown away and the vessel began to leak. The crew were making plans to forsake the vessel when the Spaniard heard them say that the two passengers were to be left behind. When this was reported to Graves, who was sick and lying on a couch below, he seized a heavy axe, gained the deck, and there was told by the captain that the crew intended to leave the passengers. "Then," exclaimed Graves, "if that be the case, let us all be drowned together. It is a pity to part good company." With his axe he then demolished the single lifeboat that the crew was preparing to launch, took command of the ship, furnished the leather from his own boots to repair the leaky valves and the vessel was saved.

Upon his return to Dublin in 1821 he soon became chief physician to the Meath Hospital and was one of the founders of the Park Street School of Medicine. It was at these two institutions that he accomplished his notable achievements. He is probably best known for his description of hyperthyroidism, a description so complete that even now that disorder is still known as Graves' disease. This article was published in 1835.

He and his followers, however, apparently attached more importance to his "Clinical Lectures," published in 1848. These lectures, taken from his clinical work, cover almost the entire field of medicine but deal principally with the various fevers. Most of the lectures are illustrated by case reports. Among original procedures described in these lectures were the recognition and significance of the pin-point pupil and the timing of the pulse with a watch. In them we note too his familiarity with the stethoscope which had been invented only a few years before by Laënnec. For example, in discussing the lung findings in influenza, he states:

> On applying the stethoscope over various parts of the lung you will hear at various parts a moist crepitus indicating the existence of serous infiltration. The smaller bronchial tubes and air vesicles are congested and filled with mucus; the blood cannot pass freely through the lung and consequently must be imperfectly aerated; the secreting and absorbing functions of the lung are deranged, and hence arises a state in which the pulmonary capillaries become congested, and permit the more fluid part of the blood to exude into the parenchyma of the lung, giving rise to what is termed serous infiltration. Something similar to this occurs also in general bronchitis, particularly in fever, but we very seldom have hepatization resulting from such causes. In hepatization the capillaries pour out not serum but lymph, which glues together the cells of the pulmonary tissue and forms a dense solid mass. Hence in influenza or bronchitis we seldom have true pneumonic inflammation.

In another lecture he justifies the use of placebos early in fevers before definite medication is indicated. After telling how some men are frank enough to say that no medicine is indicated even though the family expects it, he continues as follows:

> Conduct like this has frequently brought down great censure on medical men. It may be said that these are mere prejudiced and above the dignity of a man of firm and consistent character; but when prejudices are intimately blended with human nature, and constitute, as it were, a part of it, it is much better in many cases to submit to them, particularly when compliance does not involve a sacrifice of principle.

It seems to me that is still excellent advice and probably has much to do with the success of many men in the profession who are known for their wonderful personality.

Graves' principal scientific work was probably his fight against the various fever plagues, continuing at intervals over a period of thirty years. From his description of the tongue and other physical signs he evidently recognized the acidosis of starvation. The generalized custom before his time was to starve and purge fever patients. His treatment consisted of the administration of tonic and supportive measures. What he himself thought of this contribution can be judged from what he chose for his epitaph, namely, "He fed fevers." Other contributions he made were publications on angioneurotic edema and scleroderma.

While Graves had an aggressive, sarcastic exterior he had, like most really great men, a warm heart, as is evidenced by his reform in the hospitals in regard to the unnecessarily rough treatment of poor patients. However, he will probably be remembered longest by his innovations in medical education. He initiated and popularized the clinical method of teaching the elementary students. His death in 1853 removed an outstanding figure among the great clinicians of the 19th century.

William Wallace (1791–1837) is known principally for his introduction of the use of potassium iodide in the treatment of syphilis. He was interested too in other skin diseases and in rheumatism. Chlorine as a remedy for some skin diseases was another of his suggestions.

Abraham Colles was a distinguished surgeon of that period. His great success was gained entirely by his own efforts. He was poor and had few, if any, social connections to aid him. He was, however, one of those individuals with a single-tracked mind and that track was his profession. His birth occurred in 1773 at Milmount, 2 miles from Kilkenny, and his early education was received at an endowed school in the latter place. In 1790 he entered the University of Dublin. Here, as later, he aimed at ultimate success in life rather than at high grades alone although he passed creditably in all his work. Upon completing his studies there he became an apprentice to Dr. Woodroffe, at this time resident surgeon at Steven's Hospital. In 1795 he received his diploma from the Royal College of Surgeons of Ireland. This was followed by two sessions at the University of Edinburgh where he received his M.D. degree. Some time was then spent visiting at the various London hospitals. It was then that he met Sir Astley Cooper and the two developed a friendship that lasted throughout life. Sir Astley Cooper was then preparing some work on the subject of hernia and Colles helped him with his dissections. This experience led Colles to become more interested in anatomy and he began a book on surgical anatomy which unfortunately was never finished. In this book he departed from the customary divisions of osteology, myology, neurology, etc., and instead considered each part of the body as a unit and tried to show the relations of blood vessels, nerves, and muscles as they acted together. The impression derived from a description of this work is that it was the forerunner of the applied anatomy textbooks of today (for example that of Davis used in our school today).

The year 1797 marks his return to Dublin where, McDonald says, he began practice with astonishing industry, excellent health, amiable temper, frank vigorous character and courage, little money and practically no friends. His first hospital work was in the Sick Dispensary at Meath Street Hospital. Later he became district visitor to the Sick and Indigent Roomkeepers Society. This was more of a benevolent rather than professional work but through it he made contacts that encouraged him to stand examination for resident surgeon at Steven's Hospital to which position he was appointed in 1799.

In 1802 he was elected president of the Royal College of Surgeons of Ireland and held this position again in 1830. In 1804 he became professor of anatomy and surgery of the Royal College of Surgeons of Ireland and held this position for thirty-two years. He published his paper "On the Operation of Lithotomy" in 1811. This was based largely on his textbook of anatomy. In 1813 he reported and discussed several cases where he had ligated the subclavian artery. This was followed by an article on "Certain Diseases of the Anus and Rectum." This includes an excellent description of stricture of the rectum, which he treated by dilatation with a bougie in addition to medicine internally, and also of hemorrhoids. In his operative technique for the latter he emphasized the care to be taken lest contracture occur afterward.

His famous paper "On the Fracture of the Carpal Extremity of the Radius" was published in the *Edinburgh Medical and Surgical Journal* in 1814. His description was so accurate and thorough that that condition has since been known as Colles' fracture. I am sorry that space will not permit the incorporation of this entire paper. I would like, however, to quote just this much to give an idea of his excellence of description:

> When he [the surgeon] moves his fingers along the anterior surface of the radius he finds that it is more full and prominent than is natural; a similar examination of the posterior surface of this bone induces him to think that a depression is felt about an inch and a half above its carpal extremity. He now expects to find satisfactory proofs of a fracture of the radius at this spot. For this purpose he attempts to move the broken pieces of bone in opposite directions; but although the patient is by this examination subjected to considerable pain, yet neither crepitus or a yielding of the bone at the seat of fracture, nor any other positive evidence of the existence of such an injury, is thereby obtained. The patient complains of severe pain as often as any attempt is made to give to the limb the motions of pronation and supination.

This excerpt will show his style of expression which was not grandiloquent but rather elegantly simple, explicit and acute.

There was nothing of smallness or malice in his make-up. He stimulated and inspired his competitors and was loved by all. In 1800 when he began active teaching there were about 60 medical students in Dublin. This number had been increased to 1000 when he resigned in 1836 and no little of the credit is due him for this increase. When he began practice, surgery in Ireland was in poor repute, being considered as a side-line, and a rather despised one, of medicine. He elevated it tremendously. His home life was happy and those of his friends who knew him best loved him most.

In 1837 he published a book upon venereal diseases deciding upon this subject since he considered the confliction of opinions and lack of progress there was a discredit to the profession. A review of this book would be a subject in itself for an entire paper. Probably the most important facts he presented were these: first, the introduction of the use of small doses of mercury in the treatment of syphilis; secondly, his solution of the question as to whether or not secondary venereal lesions were capable of communicating the disease; and thirdly, the observation that syphilitic babies nursed at the breast often infected wet nurses but never their own mothers. It was this last fact that led to the establishment of Colles' law in regard to the inheritance of syphilis.

In 1839 he refused an offer of a baronetcy because such distinction had no attraction for him personally and such a hereditary title would be an inconvenient honor in consequence of the distribution he intended to make of his property amongst his children.

He died in 1843, having been a credit not only to his profession but to the manhood of his time.

Francis Rynd (1801–1861), another member of this group, was especially interested in venereal diseases, publishing an article entitled "Stricture (Pathological and Practical Observations)." His chief claim to renown, however, rests upon his introduction of the hypodermic method of medication for the relief of pain. This he accomplished by the use of a small gravity device of his own invention. He possessed an extremely modest disposition and allowed a Scotchman named Wood to be given most of the credit for priority in this field. Investigators have since clearly established, however, that that honor belongs to Rynd. In his description of the instrument and its use, he says, in part:

> The small instrument is for operations on the superficial nerves, the larger one for deep-seated nerves; for though it is not necessary to introduce the fluid into the nerve itself to ease the pain, still the nearer to the seat of pain it is conveyed the more surely relief is given . . . The fluid I have found most beneficial is a solution of morphine in creosote, 10 grains of the former in 1 drahm of the latter; six drops of this solution contain 1 grain of morphine and a grain or two may be introduced in cases of sciatica at one operation with the very best effects . . .

Such was the beginning of one of the greatest remedial measures used today for the benefit of mankind.

With such contemporaries as these, particularly those of the Meath Hospital group, any other physician prominent at that time would necessarily have to be most accomplished to be outstanding. Such a man was Sir John Dominic Corrigan. He was born in 1802, the son of moderately well-to-do parents. He received a good preliminary education and then entered Maynooth College. His aptitude for physical sciences was early apparent. After serving an apprenticeship to Dr. O'Kelly, the college physician, he went to the University of Edinburgh, where he received his M.D. degree in 1825, well qualified in French, Latin and Greek as well as the purely medical sciences. Shortly afterward he returned to Dublin and later became attached to the Jervis Street Hospital. Here he had a service of only six beds but by the proper selection and thorough study of those cases he derived most of the facts which enabled him to contribute what he did to our knowledge of aortic regurgitation. According to custom he was required to aid the hospital financially for the use of these beds and he is quoted as saying later that he accomplished what he did there by trying to get value for money spent. His paper on aortic regurgitation was published in 1832 when he was thirty years of age. Its title was "On Permanent Patency of the Mouth of the Aorta, or Inadequacy of the Aortic Valves." It was most complete and even now could nearly be considered the last word on that subject. The pathological description was enhanced by several beautiful and clear plates. It was in this paper that he described the water-hammer pulse, now more commonly known as Corrigan's pulse. In 1838 his other great paper was published on cirrhosis of the lung, distinguishing that condition from tubercular phthisis. These were his outstanding original contributions to medicine and pathology. In 1843 he applied for examination to membership of the Royal College of Surgeons of England. The first and only question asked him was, "Are you the author of the essay on the Patency of the Aortic Valves?" His affirmative answer admitted him to the society. His reputation and practice gained him other connections with hospitals and schools including the following: Diggs Street School, Peter Street School, Richmond Hospital, Cork Street Hospital and Whitworth Medical and Hardwick Fever Hospitals. As a result of this work he prepared a systematic series of lectures on "The Nature and Treatment of Fever," which he published in 1853. In addition to the papers mentioned there were others on varied subjects. His keen interest in pathology, his bedside clinics, his kind disposition and his tireless application to his work remind one of the great Osler who was to come.

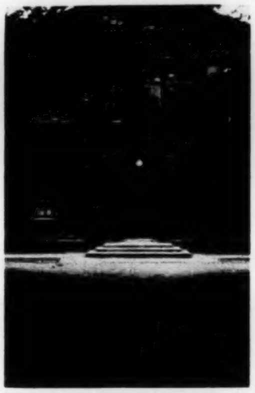

FIG. 6. RICHMOND HOSPITAL.

FIG. 7. CORK STREET HOSPITAL, DUBLIN.

Corrigan was a thoroughly big man, competent in many fields of endeavor. In fact his title was the reward largely for his work as commissioner of education for many years. During the famine of 1846 he worked for the Central Board of Health of Ireland with all his energy. Some publications at that time dealt with famine and fever. In 1847 he was appointed honorary physician in ordinary to Queen Victoria, a most unusual distinction for a Catholic. He became a Fellow of the Royal College of Physicians of Ireland in 1859 and was later president for several terms. In 1866 he published a cholera map of Ireland. During that same year he was created a baronet.

In 1877 at a meeting of the British Medical Association he delivered an address urging higher standards for the profession because of the dignity and breadth of vision which he regarded as such vital parts of a physician's make-up. It was in this speech that he uttered that eloquent statement: "We know no difference of race, or creed, or color, for every man is our neighbor."

From 1870 to 1874 he was a member of Parliament but did not distinguish himself there as he had done in other fields. Further pursuit of that work was stopped by his defeat in 1874 brought about principally by his advocacy of the Sunday Closing Law.

Throughout his life he was firm fighter for Irish freedom and religious equality for all. He was a follower of O'Connell and opposed to bloodshed and violence as means of acquiring these objectives. As Williamson states, Corrigan was a believer in the greater freedom of thought in religion, that is, the freedom to believe something and to believe much rather than that petty freedom (discussed so much even today) to believe little or nothing at all. In his later years Corrigan's comfort was disturbed by gout and in 1880 he died after several paralytic strokes.

His stainless character, his kind personality, his efforts to improve the condition of his fellowmen, his devotion to his religion when such was so unpopular and his scientific achievements (including in addition to those mentioned his observations of cerebral breathing in typhus fever, the expansile pulsation of aneurysms) well make him worthy of his title as one of the most famous Irish physician of the past.

Corrigan was the last to go and at his death the Irish School of Medicine became a part of medical history but its enviable position must be forever fresh in our memories. Until Judgment Day physicians will bring into this world babies born under Colles' law and will treat some of them later with potassium iodide solution as advocated by Wallace when they present the expansile pulsation of aneurysms as noted by Corrigan, or the slow pulse of the Stokes-Adams' syndrome if there be luetic involvement of the auriculoventricular bundle. These latter patients will have to be differentiated from those who may have been overdigitalized in an effort to relieve the decompensation of an aortic regurgitation that presents a Corrigan or water-hammer pulse. The development of Cheyne-Stokes' respiration will often warn of death's approach and the end will be more peaceful and free from pain when Rynd's suggestion for the hypodermic injection of medication is followed.

BIBLIOGRAPHY

Medicine in Ancient Erin. Lond., Burroughs Wellcome, 1909.

Medical History of Meath Hospital, Dublin, 1888.

GRAVES, R. J. Clinical Lectures. Phila., Barrington & Haswell, 1842.

PETTIGREW, T. J. Memoirs of John Cheyne. Lond., 1839.

PFENDER, C. A. Historical synopsis of the development of hypodermic medication. *Wash. M. Ann.*, 10: 346, 1911–1912.

DAVIS, N. S. Cheyne-Stokes respiration phenomena. *J. A. M. A.*, 29: 149, 1897.

STOKES, W. JR. Wm. Stokes—His Life and His Works. Lond., 1898.

ADAMS, R. Introductory Lecture Delivered on Nov. 1, 1860. Dublin, O'Toole, 1860.

WALLACE, W. A Treatise on the Venereal Disease, its Varieties. Lond., Burgess & Hill, 1833.

MCCONNELL, R. Selections from the Works of Abraham Colles, consisting chiefly of His Practical Observations on the Venereal Disease and on the Use of Mercury. Lond., New Sydenham Soc., 1881.

GARRISON, F. H. History of Medicine., Ed. 4, Phila., Saunders, 1929.

JOHN COAKLEY LETTSOM

AND HIS RELATIONS WITH JONATHAN CARVER, EXPLORER OF THE MIDDLE WEST*

By VICTOR C. JACOBSEN, M.D.

ALBANY, N. Y.

THE interest of the present generation of physicians in the biography of their forefathers is acquainting them with men who, like themselves, were possessed of varying degrees of intellectual ability and scientific acumen, but who in the average distributed their activities successfully over a wider range of human endeavor than do their scions of today. The truth of this statement cannot be denied if the "Lives" bequeathed to us are reasonably accurate portrayals. From time to time additional sides of familiar figures are discovered, or others are altered by the acquisition of new data.

Dr. John Coakley Lettsom, of London, is more or less familiar to the well-read physician, although many know him only as the subject of an amusing contemporary jingle:

I, John Lettsom,
Blisters, bleeds and sweats 'em;
If after that they please to die,
I, John, lets 'em.[1]

The man must have acquired some sort of professional popularity to occasion even such doggerel, and Pettigrew, Boswell and others have given us the picture of a many-sided individual whose influence was felt not only in England but also in America.

The life of Lettsom has recently been reviewed in the ANNALS by Sir St. Clair Thomson, hence no attempt at biographical completeness will be made.

John Coakley Lettsom, M.D., founder of the London Medical Society, biographer of John Fothergill, the Quaker physician, and himself a Quaker, was born in 1744 on Little Van Dyke, an island of the West Indies. He was one of the last of seven pairs of twins, it is said. His father, a slave-holder, was of a family from Lettsom in Cheshire, his mother one of the Coakleys who were baronets in Ireland. Young Lettsom at the age of six years met Samuel Fothergill, a preacher, and father of Dr. John Fothergill, who took charge of his education in a Friends' school and later, in 1761, placed him in the office of an apothecary, Abraham Cutliffe, of Settle, where he learned something of the medical art, botany, Latin and French. Coming later to London he met Dr. John Fothergill, who became his warm friend and adviser. Lettsom studied one year at St. Thomas' Hospital where Mark Akenside was a physician, whose harsh manners with poor patients were most repellent to Lettsom's sensibilities.

The elder Lettsom died about 1761, and in 1767 the son returned to Tortola in the West Indies, where formerly the family had had a sugar plantation. While his trip was primarily for the purpose of "taking possession of what was left of his family's property," his first act was to free all the slaves, a deed rather impoverishing at the time, but one that he always felt brought him much good fortune. In Tortola he established a practice that netted him two thousand pounds in five months. Half of this he gave his mother; the rest he took back to London, where he wished to settle down as a physician. Before doing so, however, he studied at Edinburgh under Cullen. Later at Paris he met Benjamin Franklin, who introduced him to Dubourg. Lettsom then went to Leyden, where he studied under Albinus and Gaubius, taking his M.D. degree there in 1769 with a treatise on the medical properties of tea.

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[1] There are many versions of these lines.

* A revision and enlargement of a paper "On Dr. John Coakley Lettsom and his Relations with Captain Jonathan Carver, the Explorer of Lake Pepin," published in the *Festschrift* number of the *Bulletin of Phi Beta Pi*, May, 1928, in honor of the seventieth birthday of William Snow Miller, emeritus professor of Anatomy, University of Wisconsin.

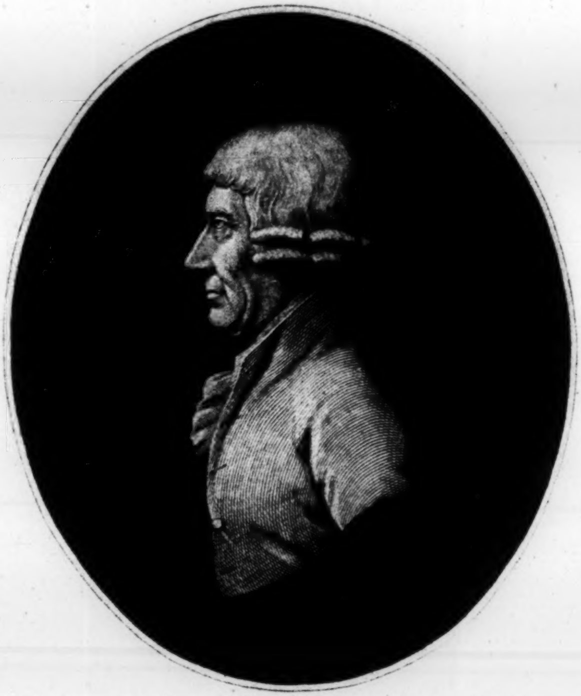


FIG. 1. JOHN COAKLEY LETTSOM, M.D., F.R.S. (FROM WAX MEDALLION IN POSSESSION OF MR. JOHN H. A. ELLIOT, GREAT-GREAT GRANDSON OF DR. LETTSOM.)

In London he became a highly successful practitioner, although he did not have and never came to have any official hospital appointments, except that of physician to the General Dispensary in Aldersgate Street, of which he was one of the founders. He published many papers on a great variety of subjects: fever, hard drinking, intussusception, inoculation for smallpox, vaccination, prostitution, wills and testaments, hints to masters and mistresses, card parties, Sunday-schools, and a substitute for wheat bread, an outgrowth of the food stringency in the war times of 1800. Edward Jenner always had Lettsom's support in the debates of that period, and Lettsom was the first to send Jenner's vaccine lymph across the Atlantic to Benjamin Waterhouse, M.D., of Cambridge, Massachusetts, who first applied it in this country. At home with a large and remunerative practice he displayed a medical ability and social philanthropy that created a highly favorable contemporary opinion, voiced by eminent men of letters of his time.

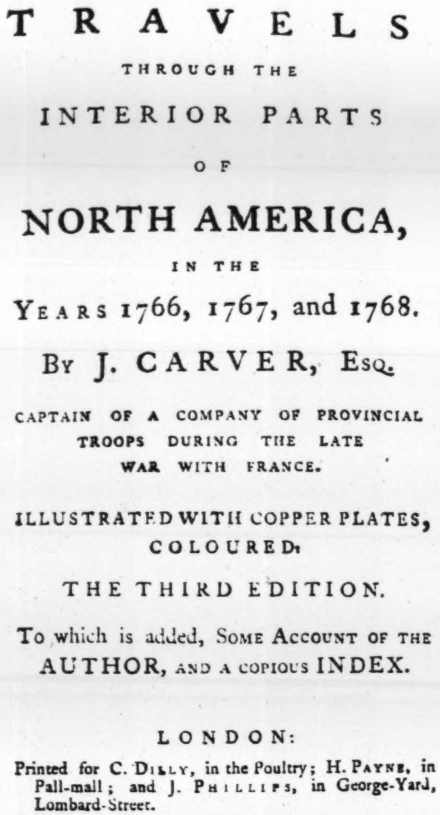
FIG. 2. JONATHAN CARVER. (FROM STEEL PORTRAIT IN CARVER'S "THROUGH THE INTERIOR PARTS OF NORTH AMERICA," LOND., 1781.)

What attracts us especially is Lettsom's interest in America and the Americans of his time. So far as the writer can determine, he never visited the mainland of this country. His American contacts were made chiefly through correspondence with the men who were engaged in evolving an independent nation out of recalcitrant colonies, among them Washington, Franklin, and Dr. Benjamin Rush. His meeting with Franklin in England in 1769 certainly exposed him to the wiles of the Pennsylvanian's diplomacy in matters affecting the good name of the colonies, and probably stimulated an already strong interest in them. As a botanist he had agents here collecting for him. But in order to enlarge our perspective of the man, it might be worthy of the time and space to draw attention to Lettsom's patronage of indigent celebrities, in particular his connection with Captain Jonathan Carver, one of the early explorers of the Middle West. Such is our present purpose.

It might seem that, in laying so much stress on Lettsom's relations with Carver, it were a case of making much out of little, since, according to his own statement, Lettsom met Carver for the first time when Carver was in his final illness and his exploring days were over. But the good doctor wasted no time in easing the last hours of the explorer, gave aid to his family, and, what served to link his name for all time with that of Carver, he published at his own expense the third edition of Carver's "Travels Through the Interior Parts of North America," including an authoritative biography. Also, Lettsom's name appears repeatedly in the proceedings over the famous Carver grant, of which more will be said later.

The following anecdote related by Fox leads to the supposition that Lettsom may unknowingly have met Carver before. One night Lettsom's carriage was stopped in the streets of London by a highwayman, who, at the point of a pistol, demanded his money, which was promptly forthcoming. The genteel manner and speech of the robber indicating no common thief, Lettsom's curiosity was aroused and he asked the man to call at his office. "Two weeks later he came and told his troubles, and how he had lately been driven to such desperate ways, and that this was only his second attempt. Lettsom left no stone unturned until he had reclaimed him; eventually he became an officer in the army, where he did honorable service." Pettigrew, Lettsom's biographer, in his memoirs relates a story Lettsom often told, about Captain Jonathan Carver, whom he referred to as a reformed highwayman.

Jonathan Carver was a grandson of William Joseph Carver, of Lancashire, who was a captain in the army under King William, and served in Ireland with such distinguished reputation that the king was pleased to reward him with the government of the province of Connecticut in New England, which appears to have been the first appointment to that station by the crown. Jonathan was born in 1710 at either Stillwater, Connecticut (Lettsom), or Canterbury, Connecticut (Peters). After receiving the rudiments of education and being designed for the practice of medicine, soon after his father's death he was placed with a physician in Elizabeth Town, Connecticut. In nearby Canterbury the leading practitioner was Dr. Joseph Perkins, the father of Dr. Elisha Perkins of "Perkins' tractors" fame. It is very probable that Carver was acquainted with Dr. Perkins, Sr., and possibly studied under him. The work requiring close perseverance and regular attention was not suited to his roving temperament, so at the age of eighteen he purchased an ensigncy in the Connecticut regiment and soon commanded a company. He was in the army under General Daniel Webb and was one of the few to escape massacre at Fort William Henry in 1757. Later he served in the army in Massachusetts, in 1762 commanding a company of foot in Colonel Saltonstall's regiment.



TRAVELS
THROUGH THE
INTERIOR PARTS
OF
NORTH AMERICA,
IN THE
YEARS 1766, 1767, and 1768.
By J. CARVER, Esq.
CAPTAIN OF A COMPANY OF PROVINCIAL
TROOPS DURING THE LATE
WAR WITH FRANCE.

ILLUSTRATED WITH COPPER PLATES,
COLOURED.
THE THIRD EDITION.
To which is added, SOME ACCOUNT OF THE
AUTHOR, AND A COPIOUS INDEX.

LONDON:
Printed for C. DILLY, in the Poultry; H. PAYNE, in
Pall-mall; and J. PHILLIPS, in George-Yard,
Lombard-Street.
MDCCLXXXI.

FIG. 3. FRONTISPIECE OF CARVER'S "THROUGH THE INTERIOR PARTS OF NORTH AMERICA," ED. 3. LOND., 1781.

The following year, 1763, the peace of Versailles took place, and Carver having discharged his military obligations to his country retired from the army. Not desiring to remain idle he considered how he could contribute to his country's interests in exploring the vast acquisition of territory in North America. Hence in the years 1766, 1767, and 1768 we find him covering practically alone a vast area in the Middle West, including the

Dakotas, Nebraska, Minnesota, and Wisconsin, living for long periods with various Indian tribes, gaining their respect and confidence, and compiling much information relating to the region, which upon his return to England he published as his "Travels," a popular book, two editions being exhausted before 1781.

The real object of this journey into the Middle West country was to discover a northwest passage to the Pacific. Carver was one of the leading figures in an expedition under Major Robert Rogers, the famous ranger of the French and Indian War.

In a sense Carver unwittingly filched Rogers' fame; his (Rogers') was the conception, the inception, and the failure of the enterprise, visionary but not ignoble, of discovering a passage across North America and finding the Oregon (now the Columbia) River. Carver, his draughtsman and third in command, with an accurate eye and the power of turning a phrase, made the expedition as far as it went famous and himself in the bargain. Because of Rogers and his plan for finding the northwest passage, Carver has given us the earliest English description of the Upper Lakes region, and a classic of early Western travel. (Kellogg.)

The beauties of Lake Pepin, a widening of the Mississippi River just south of St. Paul, Minn., Carver described at length. As Lettsom stated, his description of these vast regions seem to have pointed out every advantage which might be derived in a commercial view, from a knowledge of them, and of the policy of the various tribes who possessed them:

In his picturesque view of the scenery around Lake Pepin his imagination, animated as it was by the magnitude, the novelty and grandeur of the objects, is not so far transported, as to interrupt the most scrupulous attention to the situation, as improvable for commercial and national advantages.

Carver described the characters of the Indian tribes, learned the language of the Chippeway and Naudowissie, and became intimate with many chiefs. Then, according to Lettsom, as an acknowledgment of their grateful sense of his happy interference in settling by diplomacy a long-standing dispute the Naudowissie gave Carver a formal grant of land, lying on the north side of Lake Pepin. Lettsom says in his preface to the third edition of Carver's "Travels," that this deed was in his possession at the time of publication.

The following is a copy of the supposed conveyance of the famous Carver grant:

To Jonathan Carver, a chief under the most mighty and potent George the Third, King of the English and other nations, the fame of whose courageous warriors has reached our ears, and has been more fully told us by our good brother Jonathan aforesaid, whom we rejoice to see come among us, and bring us good news from his country. We, chiefs of the Naudowissies, who have hereto set our seals, do by these presents for ourselves and heirs forever, in return for the many presents, and other good services done by the said Jonathan to ourselves and allies, give, grant, and convey to him, the said Jonathan, and to his heirs and assigns forever, the whole of a certain tract or territory of land, bounded as follows: viz., from the Fall of St. Anthony, running on the east banks of the Mississippi, nearly southeast, as far as the south end of Lake Pepin, where the Chippeway River joins the Mississippi, and from thence eastward five days travel, accounting twenty English miles per day, and from thence north six days travel, at twenty English miles per day, and from thence again to the Fall of St. Anthony, on a direct straight line. We do for ourselves, heirs, and assigns, forever, give unto the said Jonathan, his heirs, and assigns, forever, all the said lands, with all the trees, rocks, and rivers therein, reserving for ourselves and heirs the sole liberty of hunting and fishing on land not planted or improved by the said Jonathan, his heirs and assigns, to which we have affixed our respective seals, at the great cave, May the first, one thousand seven hundred and sixty-seven.

Hawnopawjatin, The sign of the Tortoise, his mark.

Otohtongoomlisheaw, The sign of the Snake, his mark.

Carver returned to Boston in 1768, having been absent two years and five months, during which time he had traveled about seven thousand miles. He proposed publishing his journals in Boston, but receiving no encouragement there he sailed for England in February, 1769. He never returned to his native land. In England he hoped the government would reimburse him for his expenditures, General Gage having given him credentials which were most favorable to his character and attainments. The crown, however, was very slow about recognizing his claims, although it finally made a settlement of eleven hundred pounds, but "too late to revive the strength of the explorer's failing constitution and his distress of mind." Carver died January 31, 1780, at the age of seventy years.

The *Gentleman's Magazine* for 1780 contained the following item:

> We are sorry to inform our readers that we are well assured that Captain Carver died absolutely and strictly starved, leaving a wife and two small children, for whom Dr. Lettsom, with his wonted humanity, interests himself, and has disposed of many copies of his "Travels," which, notwithstanding their great merit, could not procure him a competent provision.

It was for the benefit of Carver's family that Dr. Lettsom issued the third edition of the "Travels," already mentioned, with the introductory life of the explorer. And it was the touching account the doctor gave of Carver's death in poverty and want that led to the institution of the celebrated and useful "Literary Fund" of London, for the relief of needy authors.

In his "Life of John Fothergill," Lettsom gives the following details of Captain Carver's last days:

> One instance, among numbers, I am urged to communicate here, as death now equally precludes the power of bestowing, and the gratitude of acknowledging, future bounties. Captain Carver is a name known in the annals of misery, to which he was reduced by long-continued want; disease, its natural consequence, gave him access to Dr. Fothergill; and I am informed by his widow, that as often as he applied for medical relief, the doctor as often accompanied his prescription with a liberal donation. But Captain Carver was not an importunate solicitor; the mind not hardened by familiarity of refusal, or that hath not acquired, by frequent struggles, the art of suppressing its emotions, possesses that diffidence which is the inseparable associate of worth. Between diffidence and want, many were the struggles of Captain Carver, but, overcome at length by repeated acts of the doctor's generosity, a jealous suspicion of becoming troublesome to his benefactor, determined him to prefer that want, from the deprivation of the necessaries of life, which put it out of the power of his choice; for death soon triumphs over famine. What a conflict of sullen greatness does this tragedy exhibit! When his fate was communicated to the doctor, how tender

was his expression! "If I had known his distress, he should not thus have died."

Lettsom adds as a footnote to the above:

> The king has since graciously condescended to allow the widow Carver an annuity. The unfortunate husband was only known to me on his death bed. In the early stages of his disease he was able to wait upon Dr. Fothergill; but in the progress of it, being confined to his bed, the doctor requested me to visit the captain at his lodgings; and my first interview was within three days of his decease. It was after his funeral that I felt myself more immediately interested in the succor of the widow and orphans. As the captain died pennyless, he was buried, to avoid expense, in the poor's ground, a part of the churchyard usually appropriated to the abject poor. When I reflected upon the utility of his "Traveis," I considered him as a public loss, and his offspring as the children of the public; and I presented the widow with a few pounds, to clothe and feed herself and children; but the money, thus designed to satisfy her hunger, she employed otherwise; she had the corpse of her husband taken out of the poor's ground, and buried in ground containing the ashes of higher company, and over it she raised a decent monument to his memory. His "Travels," however, will prove a more durable monument than stone; and, though the dust with which we are mixed avails not to the living or to the dead, yet I was sensibly touched with this instance of posthumous affection, and have since endeavored to mitigate the miseries of a mind endowed with such tender sensibilities.

The rest of the story centers about the famous Carver Grant, which ostensibly rendered to Captain Carver and his heirs and assigns forever, a large and valuable tract of land along the Mississippi, which includes what are now the cities of St. Paul and Minneapolis. The United States Senate from 1806 to 1824 held many hearings in an effort to ascertain the validity of the grant, and finally ruled against the claims of the purchasers of the Carver "rights." Nevertheless even to this day their descendants from time to time go over the records of the case in the vain hope of finding some evidence for prosecuting a new claim against the government. The controversy entered many channels, but the English government itself never felt certain of the validity of the deed, which apparently had a relatively short existence.

The Reverend Samuel Peters, LL.D., was a close friend and adviser of Carver's. He was also the assignee of the American heirs, and author of a "History of Connecticut," with a reputation of not always adhering to the historical truth. In his testimony at the congressional hearings he stated that Carver in his last sickness referred to the grant in his and Dr. Lettsom's presence and expressed a hope that his majesty would ratify the deed for the good of his children and for the good of the nation, as a settlement in that quarter by the English would aid greatly in civilizing a vast and ignorant Indian people. Peters, about 1798, had made the following statement: that he had learned from Dr. Lettsom and others that Mr. C. and Co. had Martha, the only child living of Carver's, marry a sailor clandestinely, and had the husband and wife take out letters of administration on Carver's estate. Mr. C. was appointed agent and had assigned to him all the land in Carver grant, one-tenth of which he reassigned to Martha and her husband. Mr. C. sent a Mr. Clark with $2,000 to get a new grant from the Naudowissies. Clark was murdered between New York and Niagara. The murderer was captured and hanged at Albany. The scheme thus fell through.

Lettsom's own testimony is confusing. On January 31, 1804, he certified that:

> . . . the printed copy of a grant of land in America, by two Indian chiefs, to Captain Carver, deceased, prefixed to his "Travels" published in London in 1781, was literally and accurately copied from a manuscript paper in the possession of his widow, Mary Carver, who declared to me that it was an original grant, conveyed to her husband by the said Indians named in the printed copy, with the facsimile or mark of each Indian.

Samuel Peters was a witness to the certificate. Later, in 1805, Lettsom wrote to a Mr. Gravener the following letter in which reference is made to this supposed grant[1]:

> During Mrs. Carver's life, I saw a paper of half a sheet, with two marks said to be those of Indian chiefs at the foot, of a grant of land, and, after Mrs. Carver's death, I searched every lodging where she had been and the place where she died, without being able to find the least vestige of paper or cloaths, not even any certificate of her having been married to Captain Carver. Unfortunately I rarely saw her out of a state of intoxication. All these facts Mrs. Pope knows very well. Mr. Knox, the late American secretary, wrote me a letter with one from Dr. Belknap, the late historian of America, that no such grant of land existed by tradition or otherwise among the Indians. Captain Carver, by his first wife, left several sons and daughters who have made the same application to me for any documents. So that, if any property could be discovered, these children who are legitimate would precede any title that could be claimed by Mrs. Pope. I once advertised to find out whether Captain Carver was married to Mrs. Pope's mother, but without success. I presume that Mrs. Pope possesses a certificate of marriage. I never saw Captain Carver but on his death bed, nor did I know of any real or supposed conveyance until after his death, when the widow showed me the paper mentioned above. Mr. Fisher, the secretary of the American board here, told me that no such document ever could be traced in his office. Mrs. Pope has given me a good deal of trouble and knows how anxious I always was to serve her, could I have done it. But I am of opinion that no legal instrument, intimated in your letter, exists, and that if it did Captain Carver's issue, by his first wife, would alone be entitled to possession, but your professional knowledge must enable you to determine upon these matters superior to that of J. C. Lettsom.

There has also been doubt in some quarters as to the authorship of Carver's "Travels," Prof. E. G. Bourne of Yale University holding to the theory that Lettsom wrote them, as his "personal relations with Carver are known to have been intimate." However, it appears well established that, since Lettsom first met Carver only a few days before the latter's death, the first and second editions had been struck off before Lettsom had anything to do with the work. His "Advertisement" in the third edition (1781) explains his connection with it.

Advertisement

Few works have had a more rapid sale than the following; two large editions having been disposed of in two years. This induced the proprietors to print a third: but, as soon as this impression was finished, I purchased both the printed copies and the copyright.

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[1] From a transcript of a letter in the State Historical Society of Wisconsin.

I have since added to the work, some account of the author's life, and an index to the "Travels," which are published separately, for the convenience of the purchasers of the first and second editions; on whom, I was unwilling to raise an extraordinary tax for the third edition.

John Coakley Lettsom
London, March 30, 1781

Professor Bourne believes strongly that most of Carver's "Travels" was plagiarized from Charlevoix and La Hontan, and parallel passages indicate that Carver must have been well acquainted with their writings. It was the custom in those times, however, in quoting other writers not to use footnotes or to give proper credit. Since Dr. Lettsom brought out the third edition, Bourne thinks it probable that Lettsom was responsible, at least editorially, for the previous editions. He states:

> If my conjecture should be shown to be a fact, we should have a curious instance of vicarious plagiarism producing a greater literary reputation for the supposed author than the real author acquired by his other works or was attained by any of the works from which he drew his material. In any case, Carver's "Travels" must now take its place in literary history beside Benzoni's "History of the New World," and the "Book of Sir John Mandeville."

This "conjecture" of Professor Bourne's was promptly disproved by the bibliographer of Carver's works, John Thomas Lee, who showed that Carver actually made his famous journey, that he was possessed of a clear and easy style of narration, and was by no means an ignoramus. Browning and T. C. Elliott, and lately Louise Phelps Kellogg, have added further support to the validity of Carver's record.

It was unfortunate that Lettsom came into Carver's life so late, as he would undoubtedly have proved a powerful friend who might have used all his resources if necessary in furthering the explorer's claims to official recognition, and in the advancement of any legitimate liaison with the colonies across the sea.

BIBLIOGRAPHY

Carver, J. Travels through the Interior Parts of North America in the years 1766, 1767, and 1768. Ed. 3, Lond., 1781.

Lettsom, J. C. Memoirs of John Fothergill, M.D. Ed. 4, Dilly, 1786.

Pettigrew, T. J. Memoirs of the life and writings of the late John Coakley Lettsom, with a selection from his correspondence. Lond., Fisher, Son & Co., 1858, 3: 393–395.

Durrie, D. S. Captain Jonathan Carver and the Carver grant. *Coll. State Historical Soc. Wisconsin*, 6: 220–270, 1872.

Thomson, St. C. John Coakley Lettsom and the foundation of the Medical Society. Lond., 1918.

The strenuous life of a physician in the 18th century. Annals Med. Hist., n. s., 1: 1, 1929.

Warbasse, J. P. Doctors of Samuel Johnson and his court. *Med. Lib. & Hist. J.*, 5: 199–200, 1907.

Fox, R. H. Dr. John Fothergill and His Friends. Lond., Macmillan, 1919, pp. 9–117.

Bourne, E. G. Jonathan Carver and His Travels. *Am. Hist. Rev.*, 11: 287–302, 1906.

Elliott, T. C. The Strange Case of Jonathan Carver and the Name Oregon. *Oregon Hist. Soc. Quart.*, 21: 366–368, 1920.

Browning, W. Early History of Jonathan Carver. *Wisconsin Mag. Hist.*, 3: 291–305, 1920.

Quaife, M. M. Jonathan Carver and the Carver grant. *Mississippi Valley Hist. Rev.*, 7: 2–25, 1920.

Kellogg, L. P. The mission of Jonathan Carver. *Wisconsin Mag. Hist.*, 12: 2; 127–145, 1928.

ELIZABETHAN ASTROLOGICAL MEDICINE*

By CARROLL CAMDEN, JR.

IOWA CITY, IOWA

> Sir Andrew: Taurus! that's sides and heart.
> Sir Toby: No, sir, it is legs and thighs.
> Twelfth Night I, iii, 148–149
>
> Besides my Lord, this day is Criticall,
> Dangerous to those, whose Chrisis is as yours:
> Tamburlaine II, 4483–4484
>
> Our doctors say this is no month to bleed.
> Richard II, I, i, 157

IT IS commonly known that astrology was a prerequisite for those who wished to practice medicine in the Middle Ages. Modern scholarship has made available much that was heretofore unknown about medieval medical lore. We know, for example, John of Burgundy's opinions on the subject, for he speaks of:

> . . . the science of Astronomy, the which science is in phisik wonder nedefull . . . for why astronomye and phisik rectifien yche other in effect and also that one science sheweth forthe many thynges hidde in the other . . . [1]

And Rhazes tells us:

> Wise physicians are agreed that all things here below, air, water, the complexions, sickness, and so on, suffer change in accordance with the motions of the planets.[2]

The "Secreta Secretorum" concurs in this:

> A Galian the full wies leche Saith, and Isoder the gode clerk, hit witnessith that a man may not perfitely can the sciens and crafte of medessin but yef he be an astronomoure. And therfor thou shalt nothing don, and namly of that which appertenyth to the kepping of thy body without consaill of astronomoure.[3]

Thomas Aquinas, as well, felt that astrology in medicine was entirely legitimate,[4] and Roger Bacon was a firm believer in the efficacy of astrological knowledge for doctors.[5] According to William of England, it was even possible by astrology to diagnose a case, and tell the color and consistency of the urine without examination.[6] Michael Scot, Petrus Hispanus, Arnald of Villanova, Raymond Lull, Peter of Abano, Cecco D'Ascoli, and countless others wrote on and believed in astrological medicine.[7] The "De Phlebotomia" of the venerable Bede, even, seems to have a firm astrological basis.[8] Nor must we forget that Chaucer's doctor was "grounded in astronomye."

When we reach the sixteenth century and the English Renaissance, perhaps we should expect the "new birth" to bring many changes to the practice of physic, especially in the exclusion of astrology. If such is our hope, however, we shall be disappointed, for the science of astrology was no less a requisite in the days of Elizabeth than it was in the days of Chaucer. Linacre's English school of medicine and the founding of the College of Physicians in 1518 probably tended to strengthen the popular belief in astrology and astrological physicians. Doctor John Halle, for instance, in 1565 gives the following advice to the prospective young doctor:

> Not onlye in chirurgery,
> Thou oughtest to be experte;

---

* This paper is a part of a longer study on Elizabethan astrology, especially its effect on literature.

But also in astronomye,
Bothe prevye and aperte.[9]

Halle was a member of the Worshipful Company of Chirurgeons and practiced as a surgeon at Maidstone, Kent. "He appears to have been a man of strong character and of great zeal in his profession."[10] It is interesting to note that although Halle wrote against the abuse of the practice of medicine, yet he felt that astrology was a very definite necessity for one who wished to become an honorable member of the medical profession.

Robert Recorde, the physician to Queen Mary, to Cardinal Pole, and to Nicholas, Archbishop of York, is another writer on astrology. He was a very learned man having publicly taught rhetoric, mathematics, music, and anatomy at Oxford, *ca.* 1525. He was created M.D. at Cambridge in 1545, was the inventor of the sign of equality, the inventor of the present method of extracting the square root, and was the first original writer in English on arithmetic, geometry, astronomy, etc.[11] He clearly shows his belief in astrology when he says:

> So was there never anye greate chaunge in the worlde, nother translations of Imperies, nother scarse anye falle of famous princes, no dearth and penurye, no death and mortalitie, but God by the signes of heaven did premonishe men therof, to repent and beware betyme, if they had any grace.[12]

Doctor Andrewe Boorde, who practiced and studied physic in Scotland and England, and who had studied abroad, was also a well-known astrologer.[13] About 1547, he published "The Pryncyples of Astronamye." After several chapters on the signs of the zodiac, the names and significations of the planets, the natural dispositions of the planets and how they operate in man's body, we find that:

> The x capytle doth shew ye pedyciall of the aspectus of the mone and other planets, and what dayes be good, and what dayes be not. &c.
>
> The xi capytle doth shew of fleubothomy or lettyng of blod
>
> The xii capitle doth shew how, whan, & what tyme, a phisicion sholde minister medycynes.[14]

He also printed "A Pronostycacyon for the Yere 1545," in the "Prologe to the reder" of which he says:

> But for as muche as the excellent scyence of Astronomy is amytted dayly to be studyed & exercysed in al universities & so approved to be ye chiefe science amonge all the other lyberal sciences, lyke to the son, the which is in the medle of the other planetes illumynatynge as wel the inferyal planetes as ye superyal planetes. So in lyke maner Astronomy doth illucydat all the other lyberal sciences, indusing them to celestyall & terrestyall knowledge.[15]

Doctor Thomas Vicary was First Warden and later Master of the Barber-Surgeons' Company in London, and chief surgeon to Henry VIII, Edward VI, Queen Mary, and Queen Elizabeth from 1535–1536 to his death in 1561–1562. In 1548 he published his "Anatomie of the Bodie of Man" which "frequently supplemented . . . held the field for 150 years." This was reprinted by the Surgeons of Saint Bartholomew's (of which he had been a Governor) in 1577.[16] He, too, recognizes the efficacy of astrological knowledge when, in discussing the brain, he says:

> Also the brayne hath this propertie, that it moveth and followeth the moving of the Moone: for in the waxing of the Moone, the Brayne followeth upwardes;

and in the wane of the Moone, the brayne discendeth downwardes, and vanisheth in substaunce of vertue: for then the Brayne shrinketh togeather in it selfe, and is not so fully obedient to the spirit of feeling. And this is proved in menne that be lunatike or madde, and also in men that be . . . moste greeved in the beginning of the newe Moone, and in the latter quarter of the Moone. Wherefore (sayth Aristotle) when it happeneth that the Brayne is eyther too drye or too moyst, then can it not worke his kinde: for then is the body made colde: then are the spirits of lyfe melted and resolved away: and then foloweth feebleness of the wittes, and of al other members of the body, and at the laste death.[17]

Jerome Cardan, moreover, who was the greatest physician of his day, was also one of the leading astrologers. In 1552 he was called to Scotland to cure Cardinal Hamilton.[18] And Sir George Ripley, in his "Compound of Alchimie," informs us:

> A good phisytian who so intendeth to be,
> Our lower astronomy him nedeth well to knowe.[19]

Robert Burton, in his well-known "Anatomy of Melancholy," gives his views on the subject as follows:

> *Paracelsus* is of opinion, *that a Physician without the knowledge of stars can neither understand the cause or cure of any disease, either of this* [melancholy], *or gout, nor so much as tooth-ache; except he see the peculiar geniture and scheme of the party affected.* And for this proper malady, he will have the principal and primary cause of it proceed from the heaven, ascribing more to stars than humours, *and that the constellation alone many times produceth melancholy, all other causes set apart.*[20]

Again:

> Astrology is required by many famous Physicians, by *Ficinus, Crato, Fernelius,* doubted of and exploded by others. I will not take upon me to decide the controversy myself; *Johannes Hossurtus, Thomas Boderius,* and *Maginus* in the preface to his Mathematical Physick, shall determine for me. Many Physicians explode Astrology in Physick, (saith he), there is no use of it, *unam artem ac quasi temerarium insectantur, ac gloriam sibi ab ejus imperitia aucupari,* but I will reprove Physicians by Physicians that defend and profess it, Hippocrates, Galen, Avicenna, &c. that count them butchers without it, *homicidas medicos Astrologiae ignaros, &c.*[21]

Much later, William Ramesey lists seven subjects which a physician must master, the chief of which is astrology. Ramesey was an M.D. from Montpellier and an extra licentitate of the London College of Physicians. He was physician in ordinary to Charles II, and was admitted M.D. at Cambridge by a royal mandate."[22] In speaking of astrology as a necessary adjunct to the practice of medicine, he states that it is:

> . . . most necessary Discipline of all the rest. Not as it is commonly practised (and indeed, abused) by broaken Mechanicks, and Illiterate Novices . . . bringing shame and contempt upon that Noble . . . Art, which, because . . . it is of excellent use in Phisicke they under that Colour, Deceive men of their moneys, and foo them out of their lives. There being more Empiricall Imposters praetending to Astrology, then are very Ideots, . . . I say, it is not this I allow, . . . but the PURE ASTROLOGY of the Antients, without which, Hippocrates and Galen accompted a PHISIAN a foole; . . . mens Bodies alter in their tēperatures with the seasons, which change according to the Motions and Places of the severall constellations and coelestiall bodies, whence follow many Infirmities and Diseases. Ergo, whosoever is ignorant of ASTROLOGY, . . . are ignorant of the Cure.[23]

He continues:

> Neither is it my Opinion only, that ASTROLOGY should be well studied and known by all that practice Physick, . . . it is the Advice of JOANNES CRATO, JOANNES FICINUS, JOANNES HOSTURTUS, ANTONIUS MIZALDUS, JOANNES BODINUS, BERNARDUS GORDONIUS, MAGINUS, and infinite others, that they be all ASTROLOGERS.[24]

The three famous Laets, as well (John, Jasper the elder, and Jasper the younger), authors of sixteenth century almanacs and prognostications, were all doctors of physic, as were countless of the almanac makers. Dr. Richard Forster, for example, an Oxford M.D. and president of the College of Physicians (1601–1604) has a prognostication and almanac for 1571.[25] Practically all of the almanacs contained rules for bloodletting, purging, and bathing, as well as the common figure of the Anatomical Man with his zodiacal signs. Some idea of the rather remarkable number of physicians who not only practiced astrology but who also made almanacs may be gained from a casual glance at Bosanquet's work on almanacs. These men were legitimate practitioners holding both degrees and licenses.

As for the branch of medicine called phlebotomy, there is no doubt that astrology was indispensible to its practice. Digges' "Prognostication" gives a warning to those who wish to bleed their patients:

> These signes are most daungerous for bludde letting, the *Moone* beying in them: *Taurus, Gemini, Leo, Virgo,* and *Capricorne,* with the laste half of *Libra,* and *Scorpius.* The rest are all good, so the *Moone* beare no dominion in that member, which ye cut: . . .[26]

Doctor Lanfranc is a popular Renaissance physician whose work was republished in 1565. He informs us:

> But thus manye thingis thou muste take kepe in blood-leting: tyme, & hour, & eir, & disposicioun of the sike man . . . [27]

And the "Regimen Sanitatis Salernitanum" discusses phlebotomy in these words:

Three speciall Months (*September, April, May*)
There are, in which 'tis good to ope a veine;
In these 3 Months the Moone beares greatest sway,
Then old or yong that store of bloud containe,
May bleed now, though some elder wizards say
Some dayes are ill in these, I hold it vaine:
September, April, May, haue dayes a peece,
That bleeding do forbid, and eating Geese,
And those are they forsooth of May the first,
Of other two, the last of each are worst.[28]

One of the most interesting works on phlebotomy is a very small one of only seven pages, written by Gabriel Harvey's brother, Richard; yet it gives in a very brief form practically all that is necessary to know in the practice of this medical science. The reason which he gives for letting blood is that "the unnaturall, naughtie, and superfluous humor" must be purged. This humor is of two kinds: either simple or mixed. It is simple if it by its own self, without mixing with any other humor, degenerates and putrifies in the blood, stopping all the pores. It is mixed when mingled with one that is already corrupted, as in the case of dropsy where the blood is mixed with water. Before the actual letting of the blood takes place, four very important things must be considered with regard to the patient. In the first place, we must ascertain whether his complexion is sanguine, melancholic, choleric, or phlegmatic. We must next note which of the four stages of life the man occupies; for the blood of a youth must be let between the change and the first quarter of the moon, that of a "manly, or middle" aged man from the first quarter to the full, that of an elderly man from the full to the last quarter, and that of a crooked-aged man from the last quarter to the change. The third consideration is the time of the month. The moon in Taurus, Gemini, Leo, Virgo, or Capricorn, for example, is a very bad time for our purpose; so, likewise, is the time when the sun, moon, or lord of the horoscope is in the sign which rules the diseased member. A day before, and a day after the full moon is bad, and so is the day before a conjunction of the moon with Mercury, Venus, or the Head or Tail of the Dragon (i.e. the ascending or descending Node of the moon). The last thing to be considered is the time of the day. The two best times for practicing phlebotomy are in the morning just before breakfast, and in the afternoon when the digestion has been perfect and the superfluities expelled. Of these, the morning is perhaps the better, if the hours of Jupiter and Venus are chosen, and the hours of Saturn and Mars are especially avoided.[29]

Since it is accepted, therefore, that a doctor must have a complete knowledge of astrology, both in bloodletting and in his other practices, in what way did he make use of this astrological knowledge? For a clear understanding of this question let us turn to two medical books which have an astrological basis. In 1598 there appeared "A Treatise of Mathematicall Physick. Or a brief Introduction to Physick, by Judiciall Astrologie. . . . Written by G. C."[30] Fifty-three years later there was published another astrological-medical text, Culpeper's "Semeiotica Vranica: or, An astrological judgement of diseases from the Decumbiture of the sick." This latter book ran through three or more editions. Culpeper was the son of a clergyman, who attended Cambridge for a short time in 1634, studying Greek, Latin, and many medical writers. About 1640 he set up as an astrologer and physician, and in 1649 he published an unauthorized English translation of the College of Physicians' "Pharmacopoeia."

According to astrological medicine, there are two kinds of diseases: acute and chronic. An acute disease is a disease of short duration, lasting never longer than a month and ending as a rule in eight days. Not one in a hundred cases lasts as long as a month, and not one in twenty lasts even half a month. The regular days on which the disease should end are the eighth, tenth, eleventh, fourteenth, twentieth, and twenty-first. Acute diseases are always judged by the moon. If the disease has not ended by the thirtieth day, it becomes chronic and is then judged by the sun. The rules for judging a chronic disease by the sun are the same as those for judging an acute disease by the moon.[31]

The consideration of critical days is very important in any discussion of astrological medicine:

> Critical dayes are nothing else but dayes wherein a man may disern a disease, or give judgement upon it, be it good or bad, it matters not much, 'tis taken by a Metaphor from the judicial Court to the Art of Physick, because, 'tis something like to plead a mans cause for his

> life, and to labour acutely under a disease to be drawn by inimicable accusers before the judgement Seat, and to run the hazzard of life, with a cruel and hostil disease. Moreover there are three things requisite to a judicial Court, the Accuser, the Person indicted, and the Judge. So likewise are there three things by which the Art of Physick consisteth, and by which every cure is perfected. 1. The Disease. 2. Nature, and the Physitian, which is natures servant, or at least should be so; and 3. the accidents which manifest what the disease is, and stand as witnesses.[32]

There are four kinds of critical days: the decumbiture, which is the day upon which the man falls ill; the crises; the judicial days; and the intercidental days.

> A man falls sick, there is the first Crisis, let the cause of the disease be what you will; when the Moon next comes to the same degree of the next sign she was in at the Decumbiture, there is the Judicial day; for in that time the disease shews it self in its colours, with bag and Baggage. When the Moon comes to her Sextile, it brings the Intercidental day, and should mitigate the disease; if she do not, she is aspected to evil Planets: and if she be aspected to ill Planets, an ill crisis is to be expected, and so the contrary; and you shall never find this fail.[33]

The directions for finding the critical and judicial days are as follows: Divide the heaven into eight equal parts, called houses. Find the sign, degree, and minute the Moon was in at the decumbiture, and place this upon the cusp (i.e. the line separating one house from the preceding of the first house. Add forty-five degrees to this to make the cusp of the second house. Forty-five degrees more brings us to the third house which is the quartile of the place of the decumbiture, and this is the first crisis. Forty-five degrees more brings us to the fourth house, which is the opposition, and this is the second crisis. Each house, then, is forty-five degrees in length. "The second Quartile of the Moon to her own place at the decumbiture makes the third Crisis: And the fourth is when she comes to the same sign, degree, and minute, that she was in at the decumbiture." These directions serve for any country, for it is not necessary to take into account the latitude of the region. The houses between the crises are called the judicial times, wherein the disease or the future of the disease may be judged. If the moon be afflicted in a critical sign by the evil aspects of Saturn, Mars, or the lord of death (i.e. the lord of the eighth house, and sometimes of the fourth) then the disease will increase. On the other hand, if in a crisis the moon is aspected by the lord of the ascendent or by the fortunes, then health will ensue.[34]

On the first thought, it would seem rather difficult to locate exactly the time of the decumbiture. It is quite simple to find the moment when the patient has taken to bed, but the beginning of the sickness is more difficult to ascertain:

> For a lusty stout man bears the disease longer, and is longer before he takes his bed, then a puny sickly man is: a meer suspition of a Sicknesse will send a faint-hearted man to bed; you may perswade him he is sick, whether he be or no.[35]

The time of the decumbiture is not, however, so difficult to find as it seems.

> The common opinion of such as are learned in Astrology is, that the moment of time is to be taken for the beginning of the disease, in which a man finds a

> manifest paine or hurt in his body: for instance, when a man hath got a Fever, usually the head akes certain dayes before; this is not the Fever, but a Messenger or forerunner of the Fever; the true beginning of the Fever is when the disease appeares sensibly, or when a horrour or trembling invades the Sick, as does usually in the beginning of a Fever; . . . [36]

Our next topic shall be that of the crisis:

> Crisis according to *Galen*, is a swift and suddain change of any disease, whereby the sick is brought to recovery, or death, and a sick man can be brought to nothing else, unlesse you will make him a beast of a man.[37]

There are two causes of the crisis: the outward and the inward. The internal action is due to the fact that either nature is laboring to expel the humor which causes the disease, or the humor itself being not fit for excretion burdens nature with its weight or quality, and thus breaks out. Some think the internal cause of the crisis is the heat and moisture of the body, especially since diseases come from an ill diet. The external cause, however, is an alteration of the air, which in turn alters the breath a man draws in from cold to hot, from dry to moist, or the opposite of these.[38] One warning must again be made, that in judging acute diseases, the aspects or radiations of the moon (i.e. her quartile or opposition) must not be taken from the conjunction of the moon to the sun as is common in almanacs, but must be taken from the place the moon was in at the time of the decumbiture.[39]

The previous discussion has dealt almost exclusively with a consideration of the critical days, and their judgment by means of the moon (in acute diseases) and the sun (in chronic diseases). That, however, is only a small part of astrological medicine. We must now take into account the other planets, and the houses as well, as they appear at the decumbiture. The signifiers, or significators, are especially important, and are of two kinds: those which are signifiers by themselves, such as the moon, the sun, and the ascendent; and those which are signifiers by accident, which are the depositors or lords of the houses, by reason of the dominion and power which they hold in the places of the former significators.[40] The significators to be considered are as follows:

1. Sickness	by themselves	Sixth house Planet or Planets in sixth house
	by accident	Depositor of the sixth house, the malevolent Planets which being *Signfiers* in any, do afflict the body, the Planet from which the Lord of the Ascendant doth separate or is separated.
2. The Physician		—Sixth house, Lord thereof.
3. Of the Physic		—Tenth house, Lord thereof, the sun.
4. End of sickness		—Fourth house, Lord thereof.
5. Of Death		—Eighth house, the Almuten thereof.[41]

Perhaps the most interesting, and certainly the most important, of the five considerations is the sickness. From this table it is obvious that the signifiers of themselves of the sickness are the sixth house and the planet or planets in the sixth house, while the signifiers by accident are: the depositors of the sixth house; the malevolent planets Saturn and Mars, which, if they be signifiers by any means, afflict the body and cause the disease to participate of their nature; and also the planet from which the lord of the ascendent is separated. The state and condition in which the signifier holds is determined in many ways: its own proper nature, the sign in which it is located, its fortitude and debility, its affection, and finally the configuration and aspects which it has with other planets.[42]

When once a figure of the heavens has been cast, and the signifiers located, it is a comparatively simple task to consult tables of signs, planets, and houses to determine what diseases and members of the body are signified by them. The significations of the signs of the zodiac, for example, are as follows:

Aries ruleth the head, ears, eyes, and diseases of them, as head-ach, tooth-ach, Infirmities of the ears, nose, eyes, morphew, scurf in the face, ring-worms, pushes, or wheals, scabs and violent feavers, offending principally the head.

Taurus Neck, throat, and the diseases of them, as the Kings evil, Squinancy, hoarsenesse, and such like infirmities happening in those parts.

Gemini Armes, shoulders, hands, and fingers, and such diseases as are incident to them, as the hand-gowt, cramp in the fingers, pain in the arms through winde, stopping the passages of the veines, vain disturbances in the phantasic.

Cancer Brest, paps, upper part of the belly, spleen, lungs; of diseases, it hath the Itch, scabbinesse, leprosies, pimpled faces, Apostumes, or ulcerous matter in the brest, Ptisick, coughs, salt phlegme.

Leo Heart, brest, stomach, back-bone, any disease neer the side or back, abundance of choler and feavers proceeding from too much increase of blood.

Virgo, Guts and belly, entrals, small guts; for diseases, the winde-collick, stopping, or melancholy, matter in the small guts, belly-ach, wormes, ulcers in the bowels.

Libra, Reins, joynts, hams, hanch, buttocks, gravel, or heat in the kidneys, retention of urine, bloud corrupted, fluxes, and a windy vapour dispersing throughout all the veins.

Scorpio, bladder and privy parts, flanck, ill sight, scabs, lepresie, but generally all impediments in the secrets or privy members, as running of the reins, the French Pox, stone, or gravel, ruptures, all Hernies, &c.

Sagittarius; Thighes: Of diseases it ruleth hot fevers, desperate fals from beasts, deprivation of members, fistula's, a full body and too much bloud.

Capricorn, Knees, Quartan Agues, Melancholy, dimness of Sight, Issues, *Sciatica.*

Aquarius, Legs, the black Jaundies, lamness in the joynts, tumours in the legs. The latter degrees of the sign denotes weak sight.

Pisces, Feet, the Gout in those parts, also imperfection in the face, Palsie, Scabs, the Cough, and imperfection in the Lungs. When any of these are in the sixth House, and either the *Moon* or Lord of the Ascendant, or part of fortune are afflicted in that signe and house, the disease is certainly of the nature of the signe and Planet.[43]

The planets have the following signification with regard to the parts and diseases of man's body:

Saturn hath the right eare, blabder (*sic*), bones and their sicknesses, proceeding of cold and driness, Lepry, Quartan Ague, Morphew, Canker, Elephansie, black Choler, Rheumes, Cough, Palsie, looseness of the body, and such like.

Jupiter, Lungs ribs, liver, gristles, seed, arteries, left eare, and infirmities of them, Pleurisies, Apoplexie, and such as proceed of abundance of bloud and windiness.

Mars governeth the gall, reins, veins, left eare, and their sicknesses, as sharp Feavers, Tertain and Quotidian, Ulcers, red Choler, Madness, Pustles, Carbuncles, Epilepsies, Yellow Jaundies, and such like: it hath likewise signification of the stones and privities.

> *Sun* signifieth the sight, heart, right side, sinews, right eye of a man, left eye of a woman, brain, and the diseases of those parts, as Rheume distilling from the head, Catarrhes, Fluxes in the eyes, Cramp, Cardiack passion, red Choler, also cold stomack and liver.
>
> *Venus*, the liver, loynes, Matrix, Genitals, Paps, Throat, Gonorrhea, Debility in the act of generation, Strangury, pilsing disease, French or Spanish pox, desire of vomait.
>
> *Mercurie*, the imagination, memory, brain, or spirits, speech, touch, fingers, hands, sinews, thighs; it noteth madnesse, Lethargie, stammering, horsenesse, coughs, falling evill, Ptisick, much spittle.
>
> *Moon* hath the left eye of a man, the right of a woman, stomack, belly, left side, bladder, stones, wombe, liver, brest, and the taste, and noteth the diseases of them, as Catarrhes, Palsie, Dropsie, Menstrues of Women, Surfets, rotten Coughs, Worms in Children or men, Apostumes, Kings-evil, Falling-sickness, Convultion-fits, default of sight, as Squintedness, diseases of the sinews coming of opilation of the Liver and of the Phlegme, small Poxes and Measels. These are the signification of the diseases from the Planets, who being either Lord of the Ascendant or sixth house, and in a signe that implies the like disease, then we may justly conclude the party is accordingly grieved, or his disease is of the same nature.[44]

To give a typical case (using only the planets and zodiacal signs to make it somewhat simpler), suppose that a patient is taken sick when the moon is in Aries and is decreasing in light and in motion, and at the same time is afflicted by a conjunction, quartile, or opposition of Saturn. The disease has then originated from a cold cause for Saturn is cold and dry, and the Moon is cold and moist. It is accompanied by a heaviness of the head, the humors of which have been "distellated" into the breast. The eyes will be weak and dull, the throat and windpipe will be stopped with phlegm, and the pulse will be "weak and inordinate." The patient will be more afflicted by night than by day. The internal organs will be quite hot, while the skin will be cold. A "loathing in the stomach, with swounings, and inordinate sweatings" will also be indicated. For assisting nature to effect a cure in this case, the doctor should prescribe things which heat and loose the belly. Bloodletting will be of no avail. Without a doubt, the patient will die if the moon does not apply to any of the fortunes. If the moon does apply to the fortunes, however, the patient will either recover, or the disease will change into another disease.[45]

It is quite obvious, then, that whatever else an Elizabethan doctor had to know, the study and practice of astrology was imperative.

REFERENCES

1. *Vide* Curry, W. C. Chaucer and the Mediaeval Sciences. N. Y., 1926, p. 6.
2. *Ibid.*, p. 7.
3. Secreta Secretorum. Early English Text Society, extra series, 74: 195–196. The Secreta was published in England in 1528 by R. Copland.
4. Cf. WEDEL, T. O. The Mediaeval Attitude toward Astrology. New Haven, 1920, p. 67.
5. BACON, R. Opus Majus. Ed. and trans., R. B. Burke, Phila., 1928, 1: pp. 397, 401, 406.
6. THORNDIKE, L. A History of Magic and Experimental Science. N. Y., 1923, 2: 92. William's work is "De urina non visa."
7. *Ibid.*, pp. 323–324, 498–499, 513, 851, 855–856, 871–872, 890, 893 ff., 957.
8. Cf. SINGER, C. A review of the medical literature of the dark ages, with a new text of about 1110. *Proc. Roy. Soc.*

Med., (1916–1917), 10: part II, sect. on Hist. Med., pp. 107–160. See especially pp. 152–153, 1313–03. Cf. also Mercier, C. A. Astrology in Medicine. Fitzpatrick Lect. delivered before Royal College of Physicians Nov. 6 and 11, 1913. London, 1914. For astrological medical manuscripts of the 14th and 15th centuries, see Thorndike, L. Science and Thought in the Fifteenth Century. N. Y., 1929.

9. Halle, J. An Historiall Expostulation against the Beastlye Abusers, both of Chyrurgerie and Physyke, in Oure Tyme. (London, 1565). Ed. T. J. Pettigrew, Percy Soc., 11: 37–38.
10. Dictionary of National Biography.
11. *Vide* Pettigrew's notes to Halle, *op. cit.*, p. 59.
12. Recorde, R. The Castel of Knowledge, London, 1556, p. 7 of Preface.
13. Boorde, A. Introduction of Knowledge. Ed. F. J. Furnivall. EETS, extra *s.*, 10: 61, 36–37, 226, etc.
14. *Ibid.*, p. 23.
15. *Ibid.*, p. 25.
16. Vicary, T. The Anatomie of the Bodie of Man. Ed. F. J. and Percy Furnivall. EETS, extra s., 53: v–vi.
17. *Ibid.*, pp. 33–34.
18. Traill, H. D. Social England. N. Y., 1895–1896, 3: 331. Cardan was an Italian who had quite a vogue in England. Cf. also Ency. Brit.
19. *Vide* Halle, *op. cit.*, p. 58.
20. Burton, R. The Anatomy of Melancholy. Ed. A. R. Shilleto, Lond., 3 vols., 1896, 1: 236.
21. *Ibid.*, 2: 17.
22. Dictionary of National Biography.
23. Ramesey, W. De Venenis; or a Discourse of Poisons; their . . . natures and virtues, with their . . . antidotes. Lond., 1663, Epistle Dedicatory.
24. *Ibid.*, Epistle Dedicatory.
25. Bosanquet, E. F. English Printed Almanacks and Prognostications, Lond., 1917, pp. 18–19, 25, 44, etc.
26. Digges, L. A prognostication of right good effect. Lond., 1555 (Repr. no. III of Old Ashmolean Reprints, ed. R. T. Gunther, Lond., 1926–27), p. 44. Cf. pp. 38–41, 45. This book had a phenomenal sale being reprinted (as A prognostication everlasting) in 1555, 1556, 1564, 1567, 1576, 1578, 1583, 1585, 1592, 1596, 1605.
27. Lanfranc. Science of Cirurgie. Early English Text Society, orig. s., 102: 298. English ed. 1565.
28. The Englishmans Doctor or The Schoole of Salerne, trans. Sir John Harington, London, 1608. Repr. ed. by F. R. Packard, N. Y., Hoeber, 1920, p. 149.
29. Harvey, R. A Compendious Table of Phlebotomie, or bloud-letting, setting downe by division the generall and speciall considerations thereunto belonging. In his: An Astrological Discourse, Lond., 1583, pp. 77–84. Cf. G., N. The English Phlebotomy. Lond., 1592; Godfridus, The Boke of Knowledge apperteynynge . . . to Astronomy. Lond., 1530; Harward, S. Harwards Phlebotomy. Lond., 1601.
30. This work is bound with the 1598 edition of Claude Dariot's A breefe introduction to the astrological iudgement of the starres. I have used the 1663 reprint of this work which is bound with and the pages numbered consecutively after Dariotus Redivivus (pp. 135–184). Cf. Hermes Trismegistus. The learned worke intituted: Iatromathematica, trans. John Harvey, Lond., 1583. Fage, John. Speculum Aegrotorum. The Sicke Mens Glasse, Lond., 1606. Salmon, W. Synopsis Medicinae, Lond., 1671. Sudhoff, K. Iatromathematiker vornehmlich im 15. und 16. Jahrhundert, Breslau, 1902.
31. Culpeper, *op. cit.*, (1658 ed.) pp. 19, 31–33.
32. *Ibid.*, pp. 14–15. Note typical argument by analogy. Cf. Heydon, C. A Defence of Indiciall Astrology. Lond., 1603, Chap. XXI.
33. *Ibid.*, p. 23.
34. *Ibid.*, pp. 31–33.
35. *Ibid.*, pp. 23–24.
36. *Ibid.*
37. *Ibid.*, pp. 14–15.
38. *Ibid.*, pp. 15–16.
39. *Ibid.*, pp. 18–19.
40. G. C., *op. cit.*, p. 137.
41. *Ibid.*, p. 140.
42. *Ibid.*, pp. 138–139.
43. *Ibid.*, pp. 144–145.
44. *Ibid.*, pp. 147–148.
45. Culpeper, *op. cit.*, p. 125.

CHILDREN OF APOLLO

By C. JEFF MILLER, M.D.

NEW ORLEANS, LA.

THE physician is always suspect who turns to follow what Goldsmith, I think, called "the draggle-tailed muses." This is partly because of an uneasy suspicion that the man who endeavors to do several things at the same time will end by doing none well, partly because one's patients are inclined to believe that a dabbler in poetry must of necessity be unfitted to be the practical guide, philosopher and friend they need when the ills of the flesh have laid hold on them. On the other hand, since poetry is life touched with emotion, it would seem that the physician is peculiarly fitted to write it. Above all men except the priest he touches life in all its aspects and he sees men and women in their joys and sorrows, in their weakness and their strength. He cannot be a true physician who is devoid of feeling and imagination, who, like the greatest Physician of us all, is not "touched with the feeling of man's infirmity."

Also by heredity the fields of poetry should be open to physicians. Dr. Sponius, physician to Louis XIV, who in a series of hexameters described the insertion of the muscles of the human body, in his preface gravely explains that since Apollo, president of Parnassus and god of poetry, was the father of Aesculapius, god of the healing art, physicians are naturally children of Apollo. In the early days, too, when the basis of medicine was less scientific than it is at present, inspiration rather than patient research was largely depended upon to supply it with its facts, for which reason medical treatises very often assumed a poetic form.

With most physicians either poetry has been an "oblique pursuit" or the men who wrote it have been laggard followers of their calling. Particularly is that true today, when the demands of the profession shut most of us off even from the ordinary amenities of life, though in a more leisurely age poetry was with many physicians a sort of secondary vocation. It is pleasant, as Sir Humphry Rolleston reminds us, to contemplate Erasmus Darwin, grandfather of the famous Charles, between his visits writing scientific and didactic verse in which he anticipated many of the generalizations of his distinguished grandson; to picture Sir Henry Halford composing elegant Latin trifles, "Nugae Metricae," as he drove from one noble sickroom to another; to recall Sir Richard Blackmore rolling out eternal epics to the rumble of his chariot wheels; and to recall John Mason Good translating Lucretius into English blank verse as he trudged the London streets.

But that would scarcely do in these days. The physician who rides in his car gets where he is going far too rapidly to compose many lines on the way, even if the stress of his life did not make his mood, as a usual thing, decidedly anti-poetic. And in this age, when the Ford and the medical degree are apparently bestowed simultaneously, if there be physicians left who trudge the streets in their practice, they are far too busy keeping themselves from being casualties to devote any thoughts at all to the lyric and the epic muse.

Charles L. Dana, in a scholarly essay which cannot be ignored by anyone who attempts to investigate the pleasant field of physic and of poetry, has pointed out that the writing of verse by doctors was a fairly common thing during Greek and Roman times, when it took the form of epigrams and epics, as well as in the Middle Ages, when a species of alliterative, semi-rhyming verse called leonine was for some reason deemed peculiarly adapted to works on sanitation and domestic medicine.Even as late as the twentieth century at least one distinguished English physician evidently had something of the same idea, for he felt called upon to describe a new operation for mastoid disease in Shakesperian pentameters. Probably facts are more easily remembered by the aid of rhyme and rhythm, but it is hard to imagine Dr. Sampson, for instance, announcing his discovery of the true nature of chocolate cysts in blank verse, or Dr. Frank giving us his latest investigations into the ovarian hormone in the form of heroic couplets.

Among ancient physicians Nicias of Cos was a poet of the pastoral school. Nicander, son of an hereditary priest of Apollo and himself priest, physician, grammarian and poet, wrote in hexameters of the bites of venomous animals and of poisons and their antidotes. Macer in the Augustan Age wrote miscellaneous verse, and a later Macer in the third century A.D. wrote a materia medica which was commended to his pupils by the great Linacre, though his knowledge of herbs was apparently more profound than his knowledge of Latin syntax. Fracastorius of the School of Salernum, to whom we owe our first accurate knowledge of the processes of infection and contagion, wrote a poem on syphilis which was considered to excel in Vergilian beauties anything written since classic days. Like Catullus he dwelt in Sirmio, and like him, though with considerably less lyric success, he celebrated in verse his lovely "all but island" home.

The habit of writing didactic and scientific verse continued, as I have said, well into the present century. Erasmus Darwin has already been mentioned. John Armstrong, an eighteenth century physician of a splenetic disposition, lost his temper on considerably more than the sixteen different occasions proposed for himself by Decimus Junius Juvenalis. In his medical essays he reminds us of Swift at his worst, while his first poem, "The Economy of Love," "hymned the praises of Venus in strains so warm that they dissolved away his practice." He also wrote a didactic poem in four books, "The Art of Preserving Health," which exhibits an occasional austere imagination and a real mastery of blank verse, though its practical directions are now of little value.

Sir Samuel Garth, a Gulstonian lecturer and Harveian orator, was one of the few prominent men of his age who did not suffer from the poisoned darts of the Little Wasp of Twickenham. On the contrary, Pope called him "the best of Christians without knowing it," and Dr. Johnson said of him that no man knew his art more or his trade less. Dick Steele dedicated "The Lover" to him. Garth was the poet of the Kit Kat Club, which, meeting at the tavern of Christopher, "immortal made by his pyes," included in its membership Addison, Steele, Walpole, Halifax and Marlborough, and of which the afterwards famous Lady Mary Wortley Montagu was the child toast. Garth's place in the Whig party was like Arbuthnot's in the Tory. He had an extensive practice among the famous men and women of his day, and was physician to the King, though he was so skeptical about remedies for himself that he allowed his final illness to take its course. He pronounced the funeral oration over Dryden, as he lay in state in the hall of the College of Surgeons, causing something of a scandal by his fulsome praises of Apollo and the classics and his scant references to Christianity. Aside from his occasional verses, written chiefly in his rôle of Club poet, "The Dispensary" is his best known work. It is a rhymed history, after the manner of Boileau, and it was written with the intention of rallying the disaffected members of the College of Surgeons to the movement to establish free dispensaries and thus break the hold of the apothecaries on the profession. It is still of interest to students of medical history, and undoubtedly it had a profound effect on Pope, but later critics are not so unanimous about its literary value as were the critics of Garth's own day.

John Wolcot, born of medical ancestors, wavered between medicine and the Church, according to which seemed to promise more, until he finally gave up both for literature. He had numerous disputes with his medical brethren, chiefly owing to his habit of encouraging febrile patients to drink cold water, and his opinion that the physician could do little more than "watch nature and give her a shove on the back if she seemed inclined to do right." He wrote in the late eighteenth and early nineteenth centuries, publishing his verses under the pseudonym of Peter Pindar, whom he described as "a distant relative of the poet of Thebes." He is noted chiefly as a satirist, not even royalty itself being exempt from his attacks, and his robust humor being frequently so coarse and profane and so nearly libellous that by no stretch of the imagination can it be called poetry.

Richard Blackmore likewise had a chequered career, though he ended as a physician to the Court and Censor of the Royal College of Physicians. He is best known as the author of "The Creation," a philosophic poem which demonstrates the existence and providence of God. Addison praised it in *The Spectator* as one of the most useful and noble productions of English verse; it was tremendously admired by Locke; Johnson said that if its author had written nothing else he would have been transmitted to posterity as one of the first favorites of the English Muses, and even the splenetic Dennis considered that it rivalled the "De Rerum Natura" in solidity and strength of reasoning. Posterity, however, has managed to control its raptures, and is more inclined to take the dispassionate view of the critic who said that on reading Blackmore's other poems, one realizes how very much worse "The Creation" might have been. Sir Richard holds the world's record for the rapid production of epics, and when he was not producing them, he was, after the fashion of his day, quarreling with his contemporaries, among whom Pope, because he described him as a "godless author," placed him in "The Dunciad."

Last of this group of uninspired versifiers is John Ferriar of Manchester. He lived in the age of Romanticism but was apparently untouched by its spirit, for, intending to prove his thesis that any one may become a genius if sufficiently industrious, he produced a horrible refutation of his point in "The Bibliomania," in which he celebrates the joys of book-collecting.

They are a prosaic enough company, these physician-poets we have been discussing, and we are inclined to echo with Arnold,

> Not here, O Apollo,
> Are haunts meet for thee.

To pass on to more inspired writers, Thomas Lodge, lawyer, freebooter, writer, and finally physician at forty-two, became an authority on the plague, from which, curiously enough, he died. He has left in the miscellanies of his age many a charming lyric, but he is more famous for having, in his "Rosalynde," provided Shakespere with the plot of "As You Like It." Thomas Campion was another Elizabethan who became a physician late in life. What sort of healer he was we do not know, but his preoccupation with court masques and the music and lyrics for them must have interfered seriously with his practice. Abraham Cowley was an Oxford scholar whose activities in the Royalist cause endangered his life. He was thereupon made an M.D. by the Archbishop of Canterbury, by the right which he still possesses but which he wisely does not exercise in this more formal age. Cowley seems to have felt that His Grace's decree had some magic power, for he forthwith applied for the mastership of the Savoy Hospital. When this was refused, he retired to the country and to letters for the rest of his life. He is a poet whose reputation has not endured because he followed fashions that were outworn and exhausted; even his fluency and ingenuity could not save him, except in occasional poems, and for the most part, like Touchstone, he is forever breaking his shins on his own wit.

Henry Vaughan, a contemporary of Cowley, studied law before he took to medicine, in which latter he achieved a considerable reputation. He dwelt aloof, in the body as in the spirit, from the world's confusion and strife. He has the absurdity, the affectation, the misplaced ingenuity which disfigures the poetry of that special age, and his early poems, in which he evidently yearned to be classed with those sealed of the Tribe of Ben, are totally out of character. Allusions to debts and taverns, to brimming cups and disorderly ladies, sit ill on the lips of the man who wrote two of the most notable of English lyrics, "The Retreat," in which he anticipated Wordworth's "trailing clouds of glory," and the touching "Departed Friends," beginning "They are all gone into the world of light." Vaughan is essentially a mystic, and he strikes a note not heard again in English verse until more than a century has passed.

Francis Thompson, not far removed from our own day, is the spiritual child of this Caroline poet. Educated by his physician father for medicine, he soon found himself unfitted for it, as indeed he was unfitted for the whole weary struggle of life, and for many years he dwelt in a hell compounded of poverty and opium until he was rescued from it by good Samaritans, who thenceforth directed his path. He wrote much that is good, but he is chiefly noted as the author of "The Hound of Heaven," which celebrates the old idea of a Christ bruising his feet endlessly over stony places, insatiate in his search of lost man, an idea that has reappeared at intervals in our literature since the lovely "Quia amore langueo" of the fifteenth century. Thompson was a devoted Roman Catholic, but his mysticism goes far beyond that or any other special creed. Always he had the real and overpowering sensation that God was seeking him; in trying to escape Him he finds torment, in surrender he finds the peace that passes all understanding. The heavenly visions are real to him. His eyes see the King in His beauty, he beholds the land that is very far off. Ever present to him is

> Christ walking on the water,
> Not of Genesareth but Thames.

Ever upon him in his "so sore loss" shines

> . . . the traffic of Jacob's ladder
> Pitched between heaven and Charing Cross.

For the rest, he was born with a high vocation to poetry, he was the "dedicated amorist" of beauty, and he preaches his doctrine, sometimes with the simplicity of Wordworth, sometimes with a splendor of phrase and a gorgeousness of diction unequalled since Keats, and sometimes, sad to say, with a collapse of words and thoughts into little more than the Latinized acrobatics of a man blinded by the enchantment of language. For the most part, however, his speech is touched with the golden radiance of an old-world missal, and he stands before us eaten up with the zeal of God's house.

Mark Akenside was the son of a butcher and was maimed for life by the blow of his father's cleaver. He tried to take Orders, and then turned to medicine, but he was never financially successful in it until a certain Jeremiah Dyson gave him a house, an allowance, a chariot, and such advertisement that he achieved a large and fashionable practice, became physician to the Queen, and was appointed Gulstonian and Croonian lecturer. He was also physician to St. Thomas's and Christ's Hospitals, where, it is said, only his learning and sagacity saved him from dismissal on charges of roughness and brutality to the poor. His early poems, chiefly odes in the manner of Gray and Collins, are remarkable for their exactness of metrical structure. "The Pleasures of Imagination," a didactic poem in two thousand lines of blank verse, would be ranked among the belated representations of an exhausted inspiration except for occasional passages in which he seems to be knocking at the door of the new Romanticism. As he took his ease in Sion, after the bestowal of Jeremiah Dyson's bounty, his poetical output became successively poorer, and he seems thoroughly to have deserved Smollett's caricature of him in "Peregrine Pickle."

George Crabbe, who was born in 1754, died in 1832, the same year as the Great Romancer. He was apprenticed to a village surgeon near Aldborough, where he slept with the stable boy, and later to a somewhat more prosperous practitioner, until at twenty-one he spent a year in the London hospitals. During this time he was carried before a magistrate on the charge of being a Resurrectionist, because his landlady mistook the baby he was dissecting in his room for her own child who had just died. His practice at home never amounted to anything, so he borrowed five pounds and returned to London, where his literary ability was finally recognized by Edmond Burke. Then he took Orders, not from any vocation but to secure enough money to marry on, and the venture turned out successfully, for he was a clergyman of the old school, a true friend of the poor, and for their benefit he continued an intermittent medical practice.

Crabbe had a custom, which could profitably become more general, of periodically burning great masses of manuscript, in which "incremations" he was aided by his children. In spite of this habit he has left a vast amount of verse, written in couplets of the old school, but without Pope's polish, and as homely as the life of which he writes. He will have none of the classic tradition of nymphs and shepherds on the lea; he tells of life

As Truth will paint it and as bards will not.

In his poetry we read of things mentioned for the first time in verse, the toil and sorrow and drab lives of the village people among whom he grew up and whom he knew intimately, for whose sake and in whose name he is voicing a rebellion against the world. There is no softening in the verses except that of his own sympathy, which has made him resolve to tell the truth, hard as it is, to a gay world that knows it not.

In his own day he was very popular. Scott and Wordsworth had some of his poetry by heart, Byron considered him "Nature's sternest painter, yet her best," he was praised by Fitzgerald, Tennyson and Cardinal Newman, and Miss Austen "could fancy being Mrs. Crabbe." He lived through a period which saw the influence of Pope wane and the full rise of the Romantic School, and it says much for his real worth that he held his own in spite of it all.

Oliver Goldsmith, whose overtures, says Sir Humphry Rolleston, medicine refused, as did several other professions, almost to the end of his life continued to knock at her gates. The College of Surgeons rejected him, the naval boards would have none of him, and on his last attempt at private practice he and the apothecary had a violent quarrel over the dosage he prescribed. The patient, wisely we cannot help feeling, sided with the apothecary, whereupon Goldsmith vowed never to practice again, in which resolution he was warmly seconded by Topham Beauclerc, who advised him, if he were resolved to kill, to concentrate on his enemies. Finally, so the story goes, he precipitated his own end by an effort to prescribe for himself, the fever potion being apparently, like Pet Marjorie's multiplication of seven times seven, what nature itself couldn't endure. He had, as one of his biographers says, in a high measure that prodigality possessed by many clever writers of bestowing his entire stock of wisdom on the reader and reserving none for the conduct of life. Certainly until his first poem, "The Traveller," was published, he was constantly in want, and to the end of his life he kept up at least a bowing acquaintance with his old friend Poverty. This poem celebrates his journey through Europe, for which his equipment consisted of one shirt, one guinea and one flute, with which latter, we are told, he performed the Orphean feat of keeping a whole French village from its lunch. Six years later came "The Deserted Village," and with these two poems he takes the rank of a good, if not a great poet in an age notable for its prose, of which his was not the least. He was a simple, generous, loving, improvident man, this Oliver Goldsmith, and if he did not adorn English medicine, at least he is one of the stars in the crown of English letters.

John Keats turned to medicine apparently because the orphaned son of a liveryman had to learn some trade. After his apprenticeship he walked St. Thomas's and Guy's Hospitals, he was a diligent note-taker and the skilled dresser of Sir Astley Cooper, and he finally passed his examination at Apothecaries' Hall with credit. I think, however, that Sir Benjamin Ward Richardson is rather fatuous when he says that if he had once tasted the true spirit of medicine he would have become one of her greatest sons. He may be right, but the Keats who during a lecture saw a whole troop of creatures floating in the sun's rays and was off with them to Oberon and fairyland to me does not promise well for very ill patients. At any rate, by what he himself terms the single real exercise of will power in his whole life, he turned from medicine to consecrate himself to poetry, and we know what his few remaining years brought forth, in "that dawn that was a sunset."

> But O, what labor!
> O Prince, what pain!

That outpouring of verse, unsurpassed in our tongue, indeed in any other, for sheer beauty and enchantment, terminated all too soon in Rome, in the little English Cemetery outside the city gates, where he lies "awakened from the dream of life," with his name writ not in water, but, as Matthew Arnold says, with Shakespere. Medicine may have suffered a loss but the whole world gained thereby when this prodigal son strayed off into a far country.

Thomas Lovell Beddoes, son of a physician, M.D. of the University of Wurzburg, professor of physiology in Zurich, never did general practice, which is perhaps just as well, for he was unquestionably mad just before his death and he probably never was entirely sane during his life. Writing in the first half of the nineteenth century, he was an Elizabethan at heart, although he has the romantic feeling of Shelley and Keats, and while he is not a great poet, he has produced occasional poems which only the greatest poets can match.

Joseph Rodman Drake, a young American poet, like Keats died of consumption in his twenties. His most popular poem, "The American Flag," cannot compare in any way with "The Culprit Fay." This poem, set in the Highlands of the Hudson, is the only real fairy story in American verse, and about it Henry Hadley, an American composer, has woven an utterly charming symphonic poem. Drake was associated with his friend, Fitz-Green Halleck, in a beautiful and romantic friendship which is unique in American letters and which is exquisitely celebrated in Halleck's poem which begins "Green be the turf above thee."

Oliver Wendell Holmes is the American Goldsmith, except for the difference of professional success. He began his general practice in Boston with the motto that the smallest fever would be thankfully received. For thirty-five years he was professor of anatomy and physiology at Harvard, occupying, as he said, not a chair but a whole settee, and he was so successful in holding his students that he was assigned the last hour in the day for his lectures, for at that time no other member of the faculty could keep them awake. He anticipated by twenty years the work of Semmelweis on the contagiousness of puerperal fever. He was a gentleman and a scholar, a physician learned in the lore of his calling, a man of the world in the highest sense of the term, and, as Howells says, universally interesting because he was universally interested.

Literature was his avocation, and he was novelist and essayist as well as poet. In the latter capacity he wrote too much and too facilely, and it is the fashion in certain quarters to sneer at his poetic output. Admitting that much of it does not rise above mediocrity, at that few of us would be willing to give up "The Chambered Nautilus," "The Last Leaf," "The One Horse Shay," and that inimitable group of poems written from 1851 through 1889, to celebrate the famous Harvard Class of '29. They are unique among college poems, with their blended pathos and humor, their exquisite propriety to the event, their smiles and their tears, and their echoes of faith and loyalty and friendship eternal.

Among modern physician-poets S. Weir Mitchell, Conan Doyle and Francis Brett Young have done more notable work in prose. W. H. Drummond has been peculiarly successful in interpreting in his poetry the characteristic life and spirit of the French-Canadian Habitants. Robert Bridges, the present Poet Laureate of England, practiced for fifteen years before he retired to letters, and now, at eighty-three, he is still writing in the shadow of the dreaming spires of Oxford. He is the only medical man among the eighteen holders of the office of Versificator Regis, though Robert Southey, who was appointed in 1813, precisely one hundred years before, was at one time a medical student. Robert Bridges succeeded Alfred Austen, receiving the laurel, as some witty critic has said, from the brow of one who uttered nothing base or in any other way worthy of note. But that cannot be said of the present Laureate. He may not be a great poet, but at least he is a sincere one, and we have to thank him for sparing the public the perfunctory odes usually associated with his office. In him the classic and the Elizabethan traditions are joined, and for pure prosody we must go back to Herrick, Carewe and their fellows to find his like. But he holds no mirror up to life, the world with its unrest and confusion and shattered faiths does not exist for him, and not emotion but satisfaction of form and speech has led him to poetry. He writes aristocratic verse, graceful and polished, if aloof, and notable for its charming pictures of "England's green and pleasant land."

In 1915 there appeared in *Punch* a poem to which the whole world made answer because in its exquisite cadences and ringing challenges it uttered a universal mood. All of us know that poem, with its almost unique beauty of rhythm and vocalized rhymes, with its unforgettable picture of the scarlet glory of poppies growing amid rows of white crosses, and some of us, at least, knew its author, that distinguished physician and pathologist, John McCrae, sometime of McGill University, now one of that all too numerous company of gallant gentlemen who sleep "in Flanders fields." All of his life, Sir Andrew Macphail tells us in his beautiful memoir of him, "he had been going to the wars," and we read for ourselves that "that which put glory of grace into all that he did was that he did it of pure love for his country." He went to this last war without illusions, his old gayety, the gayety of a man whom always dogs and children had followed, left him forever amid its horrors, but in his death he fulfilled what all of his life he had taught to his students as a religion to light their paths, "What I spent, I had; what I saved, I lost; what I gave, I have." "And so Valiant-for-Truth passed over, and all the trumpets sounded for him on the other side."

The little book of poems published after he had died is a slender sheaf of verses, just twenty-nine in all, unpretentious, shy, delicate, and touched in a curious way with the shadow of death, not death that is the King of Terrors, but death that is "rest and peace for life's tired guests," and that must, we feel, have wrapped him gently round as he himself fell on sleep behind the lines in war-torn France.

Let us leave it on that note. As Dana says, mediocrity in poetry is more of a sin than in any of the other arts, and the number of these physician-poets who have written well is not nearly as great as the number of those who have written ill. But even at that, there have been great physicians who have written good verse, at least one of medicine's prodigal sons is numbered among the great poets of the world, and a few men, of whom John McCrae ranks high, have been true children of Apollo in both regards.

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THE MEDICAL WISDOM OF NATHANIEL HAWTHORNE

By LOUIS J. BRAGMAN, M.D.

SYRACUSE, N. Y.

DELIBERATING on the choice of a vocation, Nathaniel Hawthorne wrote home from school: "I do not want to be a doctor and live by men's diseases." Nor was he ever especially fond of physicians, except for a slight homeopathic learning, due undoubtedly to contact with his sister-in-law, who conducted a shop for the sale of hahnemannian remedies.

But if the great American novelist scorned the doctor in actual life, he made ample use, as his works betray, of the dramatic values of the healing art. His best known medical man is Roger Chillingworth, portrayed with much intensity in "The Scarlet Letter" as "a man of skill in all Christian modes of physical science, and likewise familiar with whatever the savage people could teach, in respect to medicinal herbs and roots that grew in the forest." Until his arrival, the community was in a precarious condition:

> Skilful men, of the medical and chirurgical profession, were of rare occurrence in the colony. They seldom, it would appear, partook of the religious zeal that brought other emigrants across the Atlantic. In their researches into the human frame, it may be that the higher and more subtle faculties of such men were materialized and that they lost the spiritual view of existence amid the intricacies of that wondrous mechanism, which seemed to involve art enough to comprise all of life within itself.

The medical protection of Boston rested in the hands of an aged apothecary "whose piety and godly deportment were stronger testimonials in his favor than any he could have produced in the shape of a diploma;" and the surgical side was represented by one who was chiefly engaged in the "daily and habitual flourish of a razor." To such a professional body, Chillingworth, with these qualities, was a welcome addition:

> My studies in alchemy, and my sojourn for above a year past, among a people well-versed in the kindly property of simples, have made a better physician of me than many that claim a medical degree.

Regarding his further abilities, the author attests that:

> In his Indian captivity, he had gained knowledge of the properties of native herbs and roots; nor did he conceal from his patients that these simple remedies, Nature's boon to the untutored savage, had quite as large a share of his own confidence as the European pharmacopeia, which so many learned doctors had spent centuries elaborating . . . It was observed that he gathered herbs, and the blossoms of wild-flowers, and dug up roots, and plucked off twigs from the forest trees, like one acquainted with the hidden virtue in what was valueless to common eyes. He was heard to speak of Sir Kenelm Digby, and other famous men, whose scientific attainments were esteemed hardly less than supernatural, as having been his correspondents or associates.

A striking counterpart to the practice of Chillingworth, who attained considerable success, particularly with an Indian recipe "as old as Paracelsus," consists in the evil methods of Signor Giacomo, the fanatical genius in "Rappaccini's Daughter." The famous doctor was completely absorbed in his botanical garden in Padua, where he distilled plants into medicines that became as potent as charms:

> He was a tall, emaciated, sallow, and sickly looking man, dressed in scholar's garb. He was beyond the middle term of life, with gray hair, a thin gray beard, and a face singularly marked with intellect and cultivation, but which could never, even in his more youthful days, have expressed much warmth of heart.

To Giovanni, a young student in love with Rappaccini's daughter, Beatrice, Pietro Baglioni, professor at the University of Padua, and a physician of repute, offers some pertinent advice:

> It would ill become a teacher of the divine art of medicine to withhold due and well-considered praise of a physician so eminently skilled as Rappaccini; but the truth is, our worshipful Rappaccini has as much science as any member of our faculty with perhaps one single exception, in Padua, or all Italy; but there are certain grave objections to his professional character. He cares infinitely more for science than for mankind. His patients are interesting to him only as subjects for some new experiment. He would sacrifice human life, his own among the rest, or whatever was dearest to him, for the sake of adding so much as a grain of mustard-seed to the great heap of accumulated knowledge.

Asked whether many men were capable of so spiritual a love of science, Baglioni replied:

> God forbid, at least until they take sounder views of the healing art than those adopted by Rappaccini. It is his theory that all medicinal virtues are comprised within those substances which we term vegetable poisons. These he cultivates with his own hands, and is said to have produced new varieties of poison, more horribly deleterious than Nature, without the assistance of this learned person, would plague the world withal. That the signor doctor does less mischief than might be expected with such dangerous substances is undeniable. Now and then, it must be owned, he has effected, or seemed to effect, a marvellous cure; but he should receive little credit for such instances of success, they being probably the work of chance, but should be held strictly accountable for his failures, which may justly be considered his own work.

Beatrice, who has been trained in medical lore, is assisting her father in the cultivation of his garden. Rappaccini has followed an ancient manuscript by nourishing her on poisons from birth, immunizing her from all harmful products "until her whole Nature was imbued with them that she herself became the deadliest poison in existence." Giovanni is contaminated by merest contact with her, but before succumbing gives her a fatal concoction prepared by Baglioni to show his superiority in pharmacological skill to Rappaccini.

There is a similarity between this expression of the need for the humanitarian viewpoint, and "The Birth Mark," in which "a man of science, proficient in every branch of natural philosophy," desires to remove from the cheek of his otherwise perfect wife "a singular mark, deeply interwoven, as it were, with the texture and substance of her face." This blemish, like a crimson stain when she blushed, vanished when she turned pale; in shape it resembled a human hand, "of smallest pigmy size." Irked by the vascular blotch, he prepared to remove it:

> See! here is a powerful cosmetic. With a few drops of this in a vase of water, freckles may be washed away as easily as the hands are cleansed. A stronger infusion would take the blood out of the cheek, and leave the rosiest beauty a pale ghost.

So he applied the "agents powerful enough to do aught except change the entire physical system." And what though his wife perished as the result; did he not succeed in destroying the birth mark?

Not all of Hawthorne's stories of medical interest strike a gruesome chord. Hippocrates Jenkins, "The Haunted Quack," relates a humorous bit of his own experience:

> I had always entertained a predilection for the study of medicine. What has given my mind this bias, I know not. Perhaps it was the perusal of an old volume of Doctor Buchan, over whose pages it was the delight of my youthful fancy to pore. Perhaps it was the oddness of my Christian cognomen, which surely was given me by my parents in a prophetic hour. Be this as it may, the summit of my earthly happiness was to be a doctor.

His opportunity arrived when Dr. Ephraim Ramshorne "who made the care of bodies his care" took him in as his student:

> Time out of mind the most successful practitioner for many miles around, I had looked upon him as the *beau ideal* of a doctor, a very Apollo in the healing art. He was large and robust in person, and his ruby visage showed that if he grew fat upon drugs, it was not by swallowing them himself. It was never exactly ascertained from what college the Doctor had received his diploma; nor was he very forward to exhibit his credentials. When hard pressed, however, he would produce a musty old roll of parchment, with a red seal as broad as the palm of his hand, which looked as if it might have been the identical diploma of the great Boerhaave himself, and some cramped manuscript of a dozen pages, in an unknown tongue, said by the Doctor to be his Greek thesis.

Although the populace regarded him "in point of occult knowledge and skill, as a second Faustus," the village lawyer claimed that his Greek thesis was actually "a bundle of prescriptions for the bots, wind galls, spavins, and other veterinary complaints, written in high Dutch by a Hessian horse-doctor; that the diploma was all a sham, and that Ephraim was no more a doctor than his jackass."

His success was not in the least hampered by these charges, for his former medical student had been "worried into a consumption over the mortar and pestle," and Hippocrates Jenkins had promises of being kept very busy:

> The Doctor united in his own person the attributes of apothecary and physician; and as he vended, as well as prescribed his own drugs, it was not his interest to stint his patients in their enormous boluses, or nauseous draughts. . . . The greater part of my time was occupied in compounding certain quack medicines, of Ramshorne's own invention, from which he derived great celebrity and no inconsiderable profit. Besides his patent catholicon, and universal panacea, there was his anti-pertusso-balsamico drops, his patent calorific refrigerating anodyne, and his golden restorative of nature. A mixture of a little brick dust, rosin, and treacle, dignified with the title of the anthelminthic amalgam, he sold for half a dollar; and a bottle of vinegar and alum,

with a little rose water to give it a flavor, yclept the anti-scrofulous abstergent lotion, brought twice that sum.

The Doctor, addicted to his own *elixir sanitatis*, composed of brandy and bitters, died suddenly in a fit of apoplexy, and Hippocrates decided to continue his master's methods. The novelty of the old mixtures wearing off, he tried to create a new one, compounding a marvellous "Antidote to Death, or External Elixir of Longevity," which contained forty-nine different items. It nearly finished an old woman, and all but ruined his standing, until her remarkable recovery enabled him to start anew on a more conservative basis.

Another type of quack is revealed in "Dr. Grimshawe's Secret," a romance revolving around a peculiar character who believed that "all science was to be renewed and established on a sure ground by no other means than cobwebs and spiders," to the cultivation of which he devoted his life. He "professed to cure diseases of the inflammatory class, and to work very wonderful effects upon the human system," by means of an extract of cobwebs. He never sold or prescribed his nostrums, and "was not generally acknowledged by the profession, with whom, in truth, he had never claimed a fellowship."

A portrait of an apothecary is given in "Dr. Bullivant," which is a sketch of the gloomy days of early New England. His store is first described:

> Let us direct our attention to the white post newly erected at the corner of the street, and surmounted by a gilded countenance which flashes in the early sunbeams like veritable gold. It is a bust of Aesculapius, evidently of the latest London manufacture, and from the door behind it steams forth a mingled smell of musk and asafoetida, and other drugs of potent perfume, as if an appropriate sacrifice were just laid upon the altar of the medical deity. No apothecary would have deemed himself in the way of obtaining custom without setting up a gilded mortar, if not a head of Galen or Hippocrates.

Underneath this sign a number of people have gathered, curiously peeping "at the glittering array of gallipots and vials," and attracted by the printed advertisement of a panacea "promising life but one day short of eternity, and youth and health commensurate." The Doctor (so-styled by courtesy) appears as a slender and rather tall man behind the counter:

> His features are difficult to describe, possessing nothing peculiar, except a flexibility to assume all characters in turn, while his eye, shrewd, quick, and saucy, remains the same throughout. Whenever a customer enters the shop, if he desires a box of pills, he receives them with an equal number of hard, round, dry jokes,—or if a dose of salts, it is mingled with a portion of the salt of Attica,—or if some hot Oriental drug, it is accompanied by a racy word or two that tingle in the mental palate.

"The Dolliver Romance" similarly refers to the already mentioned symbols for doctor and druggist. Dr. Dolliver owned an enormous serpent which, winding around a wooden post, reached from floor to ceiling:

> This bedimmed and rotten reptile was once the medical emblem or apothecary's sign for the famous Dr. Swinnerton, who practised physic in the earlier days of New England, when a head of Aesculapius or Hippocrates would have vexed the souls of the righteous as savouring of heathendom.

The sociological aspects of disease

are considered in "The Procession of Life," an essay which aims to classify ailments into definite groups. Believing that disease pays observance to rank and wealth, and poverty and lowliness, Hawthorne says:

> Some maladies are rich and precious, and only to be acquired by the right of inheritance or purchased with gold. Of this kind is gout, which serves as a bond of brotherhood to the purple-visaged gentry. The Dyspeptics, too, are people of good standing in the world. For them the earliest salmon is caught in our eastern rivers, and the shy woodcock stains the dry leaves with his blood in his remotest haunts, and the turtle comes from the far Pacific Islands to be gobbled up in soup. They can afford to flavor all their dishes with indolence, which, in spite of the general opinion, is a sauce more piquant than appetite won by exercise. Apoplexy is another highly respectable disease. We will rank together all who have the symptom of dizziness in the brain, and as fast as any drop by the way, supply their places with new members of the board of aldermen.

He then passes to the other side, reviewing those who have been deteriorated by "the tainted breath of cities," by poor and scanty food, and by excessive and harmful types of labor:

> Behold here a train of house painters, all afflicted with a peculiar sort of colic. Next in place we will marshall those workmen in cutlery, who have breathed a fatal disorder into their lungs with the impalpable dust of steel. Tailors and shoemakers, being sedentary men, will chiefly congregate into one part of the procession and march under similar banners of disease; but among them we may observe here and there a sickly student, who has left his health between the leaves of classic volumes; and clerks, likewise, who have caught their deaths on high official stools; and men of genius too, who have written sheet after sheet with pens dipped in their heart's blood. These are a wretched, quaking, short-breathed set.

He concludes that disease is the natural aristocrat:

> Let him keep his state, and have his established orders of rank, and wear his royal mantle of the color of a fever flush; and let the noble and wealthy boast their own physical infirmities, and display their symptoms as the badges of high station. All things considered, they are as proper subjects of human pride as any relations of human rank that man can fix upon.

One pestilence that overrides economic and occupational factors is the smallpox. "The Rejected Blessing," a tale for children from "The Whole History of Grandfather's Chair," is a potent plea for universal vaccination. In 1721, while the disease was sweeping away multitudes, the Reverend Cotton Mather had noted, in a book published by the Royal Society of London, a letter written by an Italian physician, about a method known in Greece and Turkey, and by the negroes of Africa, to combat the scourge. Wishing to safeguard his own community if the idea were feasible, he consulted the physicians of Boston: "They were a very wise fraternity; and their huge wigs, and black dresses, and solemn visages made their wisdom appear even profounder than it was."

They refused to listen to him, called him mad, said he should tend to his souls and they would care for the bodies, and, in fact, the oldest doctor in town advised: "No such thing as inoculation was mentioned by Galen or Hippocrates; and it was impossible that modern physicians should be wiser than those old sages."

However, one physician stood up

for him. It was Doctor Zabdiel Boylston, who, looking "into the matter like a man of sense, and finding, beyond a doubt, that inoculation had rescued many from death," tried the experiment on his own family. But the profession arose in protest, and the populace declared that if Providence had ordained that they die of smallpox, it was sinful to aim at preventing it. They accused him of contriving "a method for conveying the gout, rheumatism, sick headaches, asthma, and all other diseases from one person to another"; and even excited threats of hanging. But better judgment ultimately prevailed, and: "in after years, when inoculation was universally practiced, and thousands were saved from death by it, the people remembered old Cotton Mather, then sleeping in his grave."

Smallpox is again the theme in "Lady Eleanore's Mantle," which shows the author's insight into some of the problems of epidemic outbreaks:

> We cannot estimate the affright which this plague inspired of yore, by contemplating it as the fangless monster of the present day. We must remember with what awe we watched the gigantic footsteps of the Asiatic cholera, striding from shore to shore of the Atlantic, and marching like destiny upon cities far remote which flight had already half depopulated. There is no other fear so horrible and unhumanizing as that which makes man dread to breathe heaven's vital air lest it be poison, or to grasp the hand of a brother or friend lest the gripe of the pestilence should clutch him.

How does the laity feel toward medical consultations? To a great extent, no doubt, as expressed in "The House of the Seven Gables":

> One, John Swinnerton by name, who appears to have been a man of eminence, upheld it, if we have rightly understood his terms of art, to be a case of apoplexy. His professional brethren, each for himself, adopted various hypotheses, more or less plausible, but all dressed out in a perplexing mystery of phrase, which, if it do not show a bewilderment of mind in the erudite physicians, certainly causes it in the unlearned peruser of their opinions.

Some miscellaneous items of medical interest may be found in various of his writings. Thus, "Egotism," or "The Bosom Serpent," is a study of a disordered mind; "The Nature of Sleep" reviews the opinions of Dr. Philip, an English physician, on the mechanism of slumber; "Thomas Green Fessenden," an (essay), includes a discussion of Perkin's Tractors; and "The Scarlet Letter" asserts that "a bodily disease which we look upon as whole and entire within itself, may, after all, be but a symptom of some ailment in the spiritual past."

"I desire not an earthly immortality," says a character in "A Virtuoso's Collection." However, Julian Hawthorne, in *Lippincott's* for January, 1890, writing of his father, declares: "The idea of a deathless man was probably one of the most familiar guests of Hawthorne's imagination all through his life. The Romance of Immortality he was specifically endowed to write."

And, further, in the preface to "The Dolliver Romance" is found the observation that he "brooded over the great mysteries of life and death, and was curious respecting the greatest of all mysteries, that which concerns the perpetuity of life itself." Both this novel, and "Dr. Heidegger's Experiment" deal with the problem of rejuvenation, which is especially elaborated on in "Septimius Felton," or "The Elixir of Life." The quest here is for "certain recipe, the true life-giving potency," which was to be found in certain mystic manuscript. What its actual composition would be could only be conjectured:

> The old physicians and chemists had strange ideas of the virtues of plants, drugs, and minerals, and equally strange fancies as to the way of getting these virtues into action. They would throw a hundred different potencies into a cauldron together, and put them on the fire, and expect to brew a potency containing all their potencies, and having a different virtue of its own. Whereas the most likely result would be of no virtue at all; or else some more powerful ingredient would tincture the whole.

But Hawthorne did not believe the secret of longevity to be chemical; certain hygienic precepts, as outlined in "Septimius Felton" must be adhered to:

> Keep thy heart at seventy throbs in a minute; all more than that wears away life too quickly. If thy respiration be too quick, think with thyself that thou hast sinned against natural order and moderation.
>
> Drink not wine nor strong drink; and observe that this rule is worthiest in its symbolic meaning.
>
> Bask daily in the sunshine, and let it rest on thy heart.
>
> Eat no spiced meats. Young chickens, new fallen lambs, fruits, bread four days old, milk, freshest butter, will make thy fleshy tabernacle youthful.
>
> Search not to see if thou hast a gray hair; scrutinize not thy forehead to find a wrinkle; nor the corners of thy eyes to discover if they be corrugated. Such things, being gazed at, daily take heart and grow.

It might be concluded that Hawthorne was wise in refraining from a too intimate contact with physicians, if he himself followed these sane rules, for do they not suggest the real and perhaps only secrets of the *elixir vitae?*

[From Schenckius: Observationum Medicarum. Francofurti, 1609.]

EDITORIAL

ADAPTATION OF A MUSEUM TO THE TEACHING OF MEDICAL HISTORY

The Annual Report on the Museum of the Royal College of Surgeons of England, June, 1929, contains matter of great interest to the medical historian, and illustrates how a collection of material not directly intended for historical purposes may nevertheless be made of great service to them. A brief abstract from the first paragraph of the Report is illustrative:

> In the Annual Reports of the last 50 years can be traced the sequence of the advances which have been made in modern Surgery. When abdominal surgery became safe, there is seen to be an influx of specimens which illustrate the surgical diseases of the ovaries and uterus. Then follow years in which the specimens of appendix become numerous, followed later by illustrations of diseases of the gall-bladder, pancreas, and stomach. There was a renal period following the pioneer operative measures of the late Sir Henry Morris. With the introduction of prostatic enucleation, there were annual records of numerous additions to the series of specimens in the museum which illustrate the pathology and anatomy of the prostate. The present extension of laryngeal surgery is emphasized by the series of specimens enumerated in the Conservator's Report for 1927.

Within very recent years the Museum has acquired many specimens illustrating the anatomy, physiology and comparative anatomy of the thyroid and pituitary glands, due to the great accession of interest and the broadening of knowledge of those two structures. Likewise the enlarged field of cerebrospinal surgery is manifested by a large number of valuable specimens deposited in the Museum. As would be expected, the College has acquired an invaluable collection of material bearing on military surgery since the World War. That part of it which deals with plastic surgery as applied to the treatment of facial wounds, will be of especial value. Its arrangement is not as yet completed. The Museum has for many years possessed the Toynbee Collection illustrating the anatomy and pathology of the ear, which is of great historic value as representing the knowledge of that subject in the early stages of its development. This has been worthily supplemented by the collection of aural anatomical and pathological specimens made by the late Mr. Arthur H. Cheatle, which is representative of the present development of that subject. These two collections offer a chance for the study of the history of the development of a special subject such as is seldom found.

The soul of John Hunter would be particularly rejoiced could it behold the splendid collections illustrating the comparatively new science of paleopathology. These include the specimens collected by Prof. G. Elliot Smith from the Egyptian cemeteries which were explored by him before they were flooded by the raising of the Aswan Dam. There are also a number of specimens illustrating British paleopathology, both of human beings and animals.

The strictly Historical Section of the Museum under the care of its Honorary Curator, Mr. C. J. S. Thompson, has become one of the most practically useful collections of its kind. Among its features of special importance may be mentioned the collection of instruments and models illustrating the development of the vaginal speculum and that illustrating the development of the trephine. Several of the Museum specimens are of somewhat macabre as well as historic interest, such as the skull and femur of Darnley, the husband of Mary, Queen of Scots, and the hands of Thomas Beaufort, the third son of John of Gaunt. It may be recollected that John Hunter had a great liking for what we might term "association specimens," and many are contained in his personal collection.

It is perhaps needless to recommend a visit to the Museum of the Royal College of Surgeons of England to Americans who are interested in medical history. All of them are probably acquainted with the history of John Hunter's collection and wish to see the skeleton of the Irish Giant and the other preparations he made at Earl's Court or at his house in Leicester Square, and those who have read of Mrs. Van Beuchtlen have a curiosity to see her interesting mummy. To such visitors there is now afforded an opportunity not only to gratify their curiosity but also to visualize many things of great importance to the more serious study of medical history. With such a museum as this and that of the Wellcome Medical Historical Museum, London, offers opportunities for study such as are hard to find elsewhere.

BOOK REVIEWS

Die Ärztlichen Kenntnisse in Ilias und Odyssee. By Prof. Otto Körner, Munchen, J. F. Bergmann, 1929.

Professor Otto Körner, the author of a standard work on otogenic diseases of the brain, meninges and sinuses and of a popular autobiography, in this interesting monograph discusses the medical knowledge of the poet or poets of the Iliad and the Odyssey, a subject that has not been treated in an exhaustive manner since Daremberg published his book in 1865. The amount of medical knowledge in the Homeric writings is surprising and proves the striking ability of the Hellenic race to observe natural events with accuracy and to record them in clear plastic language. The words and phrases for anatomic parts, physiologic functions, and for many morbid states found in Homer's epics are those used in the Hippocratic corpus and current today. Körner therefore concludes that the date of the beginning of Greek medicine must be carried back to Homer and not to Aristotle or Hippocrates. Though they had no conception of the circulation of the blood, the Homeric physicians knew considerable anatomy, so much indeed that we must conclude that they carried on dissection of the cadaver, although such a performance is not specifically mentioned. Curiously the kidneys are not referred to anywhere in the Iliad and Odyssey although the fat, in which they are imbedded, is. The poets could not have mentioned it had they not seen the kidney in its place.

It may not be amiss to give Körner's explanation of the deformity of Hephaistos (Vulcan.) He thinks the description is absolutely typical of bilateral dislocation of the hips. The deformity was congenital, as Hephaistos himself says (Odyssey 8, 310–312): "With weak legs was I born and no one is to blame except both my parents. If only they had not conceived me." And in the Iliad he explains how his mother tried to kill him when she discovered his deformity by throwing him from Olympus into the sea.

David Riesman.

History of Blockley. F History of the Philadelphia General Hospital from Its Inception, 1731–1928. Compiled by John Welsh Croskey, m.d. Illustrated with 15 half-tone plates. Philadelphia, T. A. Davis Co., 1929.

This large volume devoted to the history of the Philadelphia General Hospital, more generally known as Blockley, and until 1835 officially designated the Philadelphia Almshouse and Hospital, contains much material of value for the medical historian. It is quite natural that those who have served within its walls should become inspired with "the spirit of old Blockley" but it is unfortunate that so many of them persist in asserting the claim that it is the oldest *hospital* in the United States. The same claim has been made for Bellevue Hospital in New York which grew out of the "Publick Workhouse and House of Correction of the City of New York." No one can, nor would wish to deny that both these institutions had infirmaries within their walls for the care of such of their inmates as were ill and required medical care, but the primary function of both was to serve as almshouses, or poorhouses, for the housing of the indigent who were unable to work, and their development as hospitals was secondary to this. There are many proofs to show that the first hospital, in the modern sense of the word, founded in this country was the Pennsylvania

Hospital, which was chartered in 1751, opened for patients in the same year, and since 1755 has occupied its present location in Philadelphia and carried on its mission for the care of the sick and injured. The application for a charter for the Pennsylvania Hospital in 1751 states that though the laws of the "Province have made many compassionate and charitable Provisions for the Relief of the Poor, yet something farther seems wanting in Favour of such, whose Poverty is made more miserable by the additional Weight of a grievous Disease." Benjamen Franklin in his "Autobiography" states the circumstances attending the origin of the Pennsylvania Hospital, as follows:

> In 1751 Dr. Thomas Bond, a particular friend of mine, conceived the idea of establishing a hospital in Philadelphia, (a very beneficent design, which has been ascribed to me, but was originally and truly his) for the reception and cure of the poor sick persons, whether inhabitants of the province or strangers. He was zealous and active in endeavoring to procure subscriptions for it; but the proposal being a novelty in America, and at first not well understood, he met with but little success.

There are numberless records in the early registers of the Pennsylvania Hospital of patients being transferred to its wards from the Almshouse in order that they might receive medical or surgical care. In this connection a most flagrant error occurs on page 14 of Dr. Croskey's book. In 1787, the Rev. Manasseh Cutter visited the Pennsylvania Hospital, accompanied Dr. Rush on his visits to the wards, and afterwards wrote an interesting account of what he saw. This is transcribed by Dr. Croskey as the record of a visit to the "Philadelphia Hospital," an obvious error. Cutter mentions the institution he visited in such a way as to leave absolutely no doubt of its having been the Pennsylvania. He describes the building in exact conformity with the Pennsylvania Hospital as it was at that time. Again Dr. Rush was only connected with the Philadelphia Almshouse and Hospital from 1774 to 1777, according to Dr. Croskey's own statement on page 529. On the other hand from 1783 until the day of his death Dr. Rush is said to have never omitted his daily visit to the Pennsylvania Hospital, and Cutter states that he accompanied Dr. Rush as he made his visit to his wards.

An even more flagrant error occurs in the reproduction of William Hulet's engraving of the panorama of Philadelphia drawn by Nicholas Garrison. This engraving, of which the reviewer owns an original impression, shows the most impressive buildings which existed in Philadelphia at the time when the artist executed his drawings, sometime between 1755 and 1760. The various structures are lettered, and their names given after the corresponding letter in a footnote. The picture is entitled "A View of the House of Employment, Almshouse, Pennsylvania Hospital, and part of the City of Philadelphia." The letters show that the two first named institutions occupied the block between Spruce and Pine and Tenth and Eleventh Streets. The buildings are labelled *A*, "the Managers' Apartments"; *B.B.*, "the House of Employment"; *C.C.*, "the Almshouse." In the block between Spruce and Pine, and Eighth and Ninth Streets, is the Pennsylvania Hospital, marked *D.*, with the name after the corresponding *D.* at the bottom of the picture.

In the reproduction of the "View" in Dr. Croskey's book, the picture is cut into two parts. The Almshouse and Bettering House are not shown. The Pennsylvania Hospital appears still retaining the *D.* to distinguish it, but, most remarkable of all, the legends are removed from the lower margin, and instead we read, "The Philadelphia Almshouse, 1731. The Green Meadows, Second and Third and Spruce and Pine Streets." Such a transformation of a perfectly simple drawing is hard to imagine.

Following the Introduction, by Dr.

Croskey, is a reprint of an address delivered by the distinguished surgeon, D. Hayes Agnew, sometime about 1861, entitled "The Medical History of the Philadelphia Almshouse."

Although inaccurate in some of its statements it is an interesting resumé of the medical and surgical work done in its wards during the first half of the nineteenth century. The next section is entitled "The Philadelphia Almshouse and the Philadelphia Hospital from 1854 to 1908," by the eminent neurologist, Dr. Charles K. Mills. This is a reprint of an article which Dr. Mills contributed to the "Founders Week Memorial Volume," published in 1909, under the editorship of the late Frederick P. Henry. Like all the historical contributions of Dr. Mills this is not only well written but historically accurate. The history of the institution from 1908 to 1928 is well told by Dr. Joseph C. Doane. In the following section Dr. J. Chalmers Da Costa contributed a charming address which he delivered some years since. Replete with learning, wit, and abundant reminiscence, it is a delightful bit. The history of the "School of Nurses" is adequately treated by Miss S. Lillian Clayton. This training school was established in 1883 and is one of the best known in the United States. Following this is a series of biographic sketches of deceased medical men who had been attached to the institution, and a list of living medical men who are or have been attached to it. Next is a reprint of a newspaper obituary notice of a man who was head chef at Blockley for some thirty years. Lastly there is reprinted an address made by Dr. Charles K. Mills, in 1918, on the Philadelphia General Hospital and the World War. It is good that the history of a great institution such as this should be permanently recorded, and although we have felt obliged to point out certain glaring errors at the beginning of this review, nevertheless the work contains much of interest in the medical history of Philadelphia. FRANCIS R. PACKARD.

THE LIFE OF HERMANN M. BIGGS, Physician and Statesman of the Public Health. By C. E. A. Winslow. Phila., Lea & Febiger, 1929.

In this biography Professor Winslow has given us an interesting and sympathetic account of the life of Dr. Biggs, but he has done much more than this. He has brought in the development of the knowledge of infectious diseases and of the measures for their control because these played an important part in the life of Dr. Biggs and he played a large part in influencing them. The life of the man and the advances in measures pertaining to the public health are closely interwoven. Dr. William H. Welch has contributed an interesting foreword to the life of his former student, for Biggs was one of the many who came under the influence of Dr. Welch in his early days in medicine.

Born at Trumansburg, N. Y., in 1859, he entered Cornell University in 1879 and graduated in 1882. His choice of a profession was evidently influenced by his living at Ithaca with an aunt whose husband was a physician. He was allowed to spend part of his final year in the Arts course in studying medicine in New York. That this touch with medicine influenced him is suggested by the title of his graduation thesis, "Sanitary Regulations and the Duty of the State in Regard to Public Hygiene," surely an unusual subject for a thesis for the degree in Arts. He took his work in medicine at the Bellevue Hospital Medical College and there came under the influence of some unusual men, especially Joseph D. Bryant, Austin Flint, Sr. and Jr., E. G. Janeway, W. T. Lusk and W. H. Welch. Surely he was happy in his teachers.

After a period of study abroad he returned to New York and began work in the Carnegie Laboratory, soon being given teaching positions and hospital appointments. There was a steady increase in the responsibility of the positions which he held and he was drawn more and more into the problems of the control of infectious diseases and the administrative side of public health. The story of his work in the Health Department of the City of New York and afterwards in the New York State Department of Health is described with detail and absorbing interest.

The life of Dr. Biggs illustrates a fortunate conjunction of the man and the opportunity. The new knowledge of the cause and nature of infectious diseases came to a man who had the imagination to see the importance of these discoveries, and the ability to apply them in a practical way. The two are not often combined. He had a remarkable success in his influence on governing bodies in carrying through his projects. As Dr. Welch says: "Mayors and Governors, Tammany and Anti-Tammany politicians, health commissioners might come and go" but Biggs went on in his advances for the public health. Perhaps his most important contributions were in the field of the control of tuberculosis and it was in some of these measures that he found the greatest opposition from members of his own profession.

Not least to be admired in Hermann Biggs was his clear vision of what should be done and his ability to carry it through. He was fortunate in his choice of assistants, to whom he was able to hand over much of the routine administration. He has well been termed a sanitary statesman. In addition to his work in public health he taught successively pathology, therapeutics and medicine, and practiced as a medical consultant.

This biography can be very highly recommended to the profession. To the older members it will bring back the story of the development of our knowledge of many infections and the controversies about their control. To the young physician it will give a picture of the road, which today is clear and well marked, when it was only a trail and often not well marked at that—the road which led to the measures of public health which we have today. Professor Winslow has given us a fascinating story. The publishers have done their work well and there are a number of interesting illustrations. Thomas McCrae.

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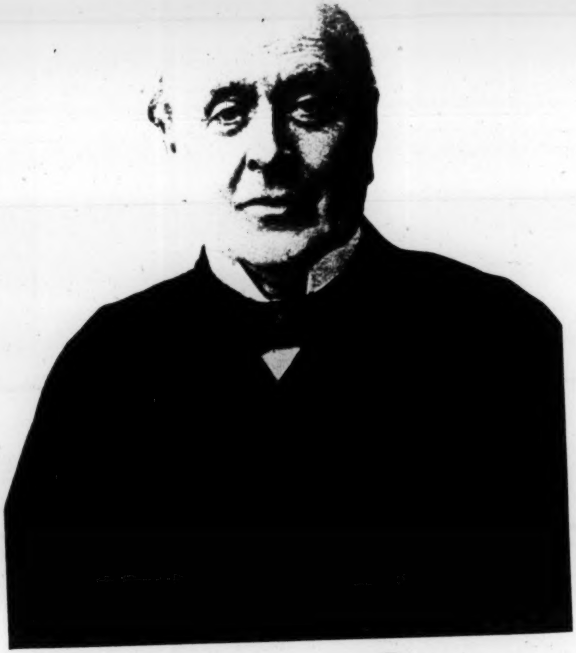
Annals of Medical History
May, 1930



Alph Guérin

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